Issue: AN ORDINANCE OF THE COUNCIL OF THE CITY OF NIXA AUTHORIZING THE DIRECTOR OF PLANNING AND DEVELOPMENT TO ACCEPT THE DEDICATION OF PUBLIC STREETS AND EASEMENT TO THE CITY OF NIXA, AS SHOWN ON THE PRELIMINARY PLAT OF THE WALKER ESTATES SUBDIVISION, GENERALLY LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF MAIN STREET AND TRACKER ROAD, UPON THE APPLICANT FILING AND RECORDING A FINAL PLAT THAT SUBSTANTIALLY CONFORMS TO THE PRELIMINARY PLAT; AND AUTHORIZING THE CITY CLERK TO SIGN THE FINAL PLAT UPON COMPLIANCE WITH ALL THE TERMS OF THIS ORDINANCE.

Date: August 23, 2021

Submitted By: Garrett Tyson, Director of Planning and Development

Background

The Walker Estates subdivision is a mixed-use subdivision located within the R-1 single-family residential, R-3 multi-family residential and General Commercial (GC) zoning districts. The subject property was annexed into the Nixa City Limits in 2021 and the existing zoning arrangement was established at that time. The property owner has submitted a preliminary plat illustrating the proposed arrangement of new lots and the public infrastructure required to serve them.

Preliminary plats are a means to provide subdivision developers with an initial approval concerning compliance of the planned arrangement with the City's zoning, subdivision, and other pertinent regulations prior to engaging the more expensive actions of detailed engineering and construction.

Analysis

The Walker Estates subdivision proposes to create 25 single-family residential lots that are all planned to be served by public streets, municipal water, municipal sanitary sewer, and municipal electric services. Additionally, the subdivision will create a 1.66-acre lot within the General Commercial (GC) zoning district, two lots within the R-3 zoning district, and two common areas containing sinkholes that also function as part of the subdivision's overall stormwater management scheme. The common areas will be owned and maintained by an association of property owners within the subdivision.

Recommendation

Staff has reviewed the preliminary plat and has determined the document to be in substantial conformance with the applicable regulations of the Nixa City Code concerning major subdivisions within the R-1, R-3 and GC zoning districts.

AN ORDINANCE OF THE COUNCIL OF THE CITY OF NIXA APPROVING THE PRELIMINARY PLAT OF THE WALKER ESTATES SUBDIVISION GENERALLY LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF MAIN STREET AND TRACKER ROAD AND AUTHORIZING CERTAIN CITY OFFICIALS TO TAKE CERTAIN ACTIONS UPON THE FILING OF A FINAL PLAT.

_____

WHEREAS an original Preliminary Plat of the Walker Estates Subdivision dated June 18, 2021, is on file with the City's Department of Planning and Development ("Preliminary Plat"); and

WHEREAS the Department of Planning and Development has issued a staff report finding the Preliminary Plat to be in substantial compliance with the requirement of the Nixa City Code; and

WHEREAS the Planning and Zoning Commission considered the Preliminary Plat at their meeting on August 2, 2021; and

WHEREAS the Commission, after considering the Preliminary Plat, staff's recommendation regarding the Application, and after holding a public hearing on the Application, issued a recommendation of approval of the Preliminary Plat; and

WHEREAS the City Council, now having considered the Preliminary Plat, staff's recommendation regarding the Application, and after providing an opportunity for public comment on the Preliminary Plat, now desires to approve the Preliminary Plat; and

WHEREAS the City Council desires to authorize the Director of Planning and Development and City Clerk to take certain actions consistent with this Ordinance.

NOW, THEREFORE, BE IT ORDAINED BY THE COUNCIL OF THE CITY OF NIXA, AS FOLLOWS, THAT:

SECTION 1: City Council hereby approves the Preliminary Plat of the Walker Estates Subdivision which is generally located at the southeast corner of the intersection of Main Street and Tracker Road, as approved by the Planning and Zoning Commission. The original preliminary plat of the Walker Estates Subdivision is on file in the Department of Planning and Development, a reduced version of which is attached hereto for general reference as "Council Bill Exhibit A." All of "Council Bill Exhibit A" including any referenced attachments, is hereby incorporated herein by this reference.

SECTION 2: The Director of Planning and Development, on behalf of the City of Nixa, is hereby authorized to accept the land, easements, and improvements dedicated to the City, as shown on the Preliminary Plat of the Walker Estates Subdivision, upon: (1) the applicant filing and recording a final plat which is in accordance with this Ordinance, including any conditions attached to and described in "Council Bill Exhibit A," and the Subdivision Regulations of the City and said final plat shall substantially

conform to the Preliminary Plat, and (2) upon the Director of Public Works certifying to the Director of Planning and Development that the public improvements have been made in accordance with the City standards and specifications. Said public improvements shall not be accepted until the occurrence of the above written conditions.

SECTION 3: The final plat shall not be recorded until: (1) the public improvements relating to the Preliminary Plat have been constructed according to the specifications of the City of Nixa, Missouri, and are approved by the Director of Public Works, and all engineering fees, permit fees, licenses, and other fees occasioned by or in connection with the construction of said improvements have been paid to the City; or (2) in lieu of construction of the improvements, that the Developer has filed with the Planning and Development Director, according to the terms of the Subdivision Regulations of the City, the prescribed financial assurances in a form acceptable to the City to ensure the construction of the improvements and the payment to the City of all engineering fees, permit fees, licenses, and other fees occasioned by, or which will be occasioned by, the construction of the improvements.

SECTION 4: Upon compliance with all the requirement of this Ordinance, including any conditions described in “Council Exhibit A”, the City Clerk is hereby authorized to endorse the City Council’s approval upon the final plat pursuant to Section 445.030 RSMo., and such endorsement shall constitute the acceptance of the Public Improvements contained therein.

SECTION 5: This Ordinance shall be in full force and effect from and after its final passage by the City Council and after its approval by the Mayor, subject to the provisions of section 3.11(g) of the City Charter.

[Remainder of page intentionally left blank. Signatures follow on the next page.]

ADOPTED BY THE CITY COUNCIL THIS 23RD DAY OF AUGUST 2021.

ATTEST:

_____ _____

CITY CLERK PRESIDING OFFICER

APPROVED BY THE MAYOR THIS _____ DAY OF _____ 2021.

ATTEST:

_____ _____

CITY CLERK MAYOR

APPROVED AS TO FORM:

_____

CITY ATTORNEY

COUNCIL BILL EXHIBIT A

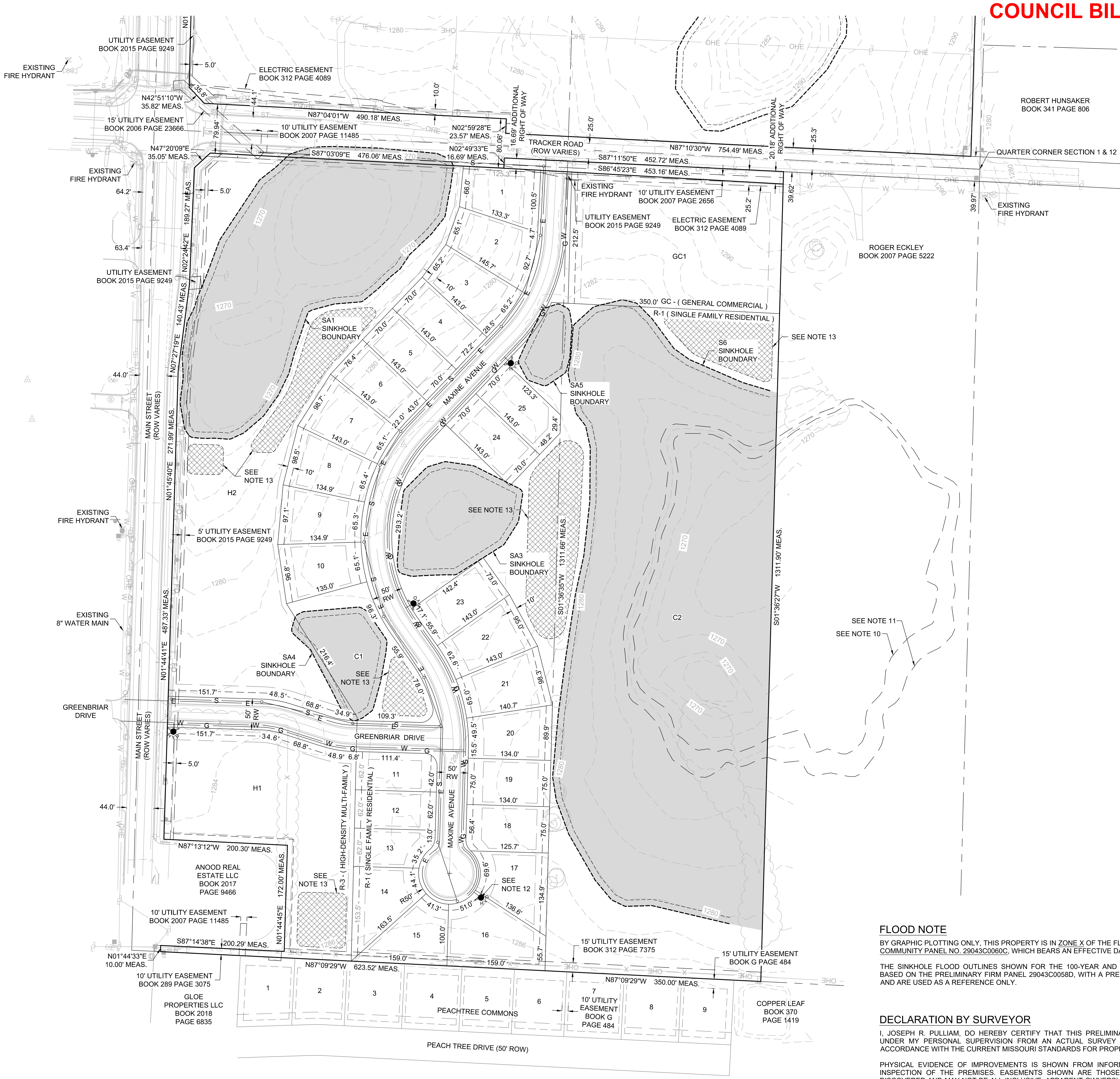
PRELIMINARY PLAT
WALKER ESTATES SUBDIVISION

A SUBDIVISION IN THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 12, TOWNSHIP 27 NORTH, RANGE 22 WEST OF THE FIFTH PRINCIPAL MERIDIAN, CITY OF NIXA, CHRISTIAN COUNTY, STATE OF MISSOURI.

OWNER: DON E. WALKER AND LOIS M. WALKER

DEVELOPER: MORELOCK BUILDERS & ASSOCIATES

722 W. OLIVE STREET
SPRINGFIELD, MISSOURI 65806



SINGLE FAMILY RESIDENTIAL DISTRICT		
LOT #	SQ. FT.	AC.
1	10,602	0.24
2	11,613	0.27
3	11,613	0.27
4	10,170	0.23
5	10,009	0.23
6	10,069	0.23
7	11,540	0.26
8	11,192	0.26
9	10,789	0.25
10	10,758	0.25
11	8,057	0.18
12	8,129	0.19
13	7,497	0.17

SINGLE FAMILY RESIDENTIAL DISTRICT		
LOT #	SQ. FT.	AC.
14	11,148	0.26
15	10,670	0.24
16	15,077	0.35
17	11,328	0.26
18	10,002	0.23
19	10,050	0.23
20	10,492	0.24
21	11,409	0.26
22	11,114	0.26
23	10,435	0.24
24	10,010	0.23
25	9,794	0.22

COMMON AREA		
LOT #	SQ. FT.	AC.
C1	28,919	0.66
C2	448,246	10.29

GENERAL COMMERCIAL		
LOT #	SQ. FT.	AC.
GC1	72,410	1.66

HIGH-DENSITY MULTI-FAMILY		
LOT #	SQ. FT.	AC.
H1	75,979	1.74
H2	237,464	5.45

LEGEND

ADJOINING PROPERTY LINE
UTILITY EASEMENT LINE
SETBACK LINE
SINKHOLE BOUNDARY
SINKHOLE (NO CONSTRUCTION LIMITS)

FLOOD NOTE

BY GRAPHIC PLOTTING ONLY, THIS PROPERTY IS IN ZONE X OF THE FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NO. 29043C0060C, WHICH BEARS AN EFFECTIVE DATE OF DECEMBER 17, 2010.

THE SINKHOLE FLOOD OUTLINES SHOWN FOR THE 100-YEAR AND 500-YEAR FLOODPLAINS ARE BASED ON THE PRELIMINARY FIRM PANEL 29043C0058D, WITH A PRELIMINARY DATE OF 2019/09/20 AND ARE USED AS A REFERENCE ONLY.

DECLARATION BY SURVEYOR

I, JOSEPH R. PULLIAM, DO HEREBY CERTIFY THAT THIS PRELIMINARY PLAT WAS PREPARED UNDER MY PERSONAL SUPERVISION FROM AN ACTUAL SURVEY OF THE LAND HEREIN, IN ACCORDANCE WITH THE CURRENT MISSOURI STANDARDS FOR PROPERTY BOUNDARY SURVEYS.

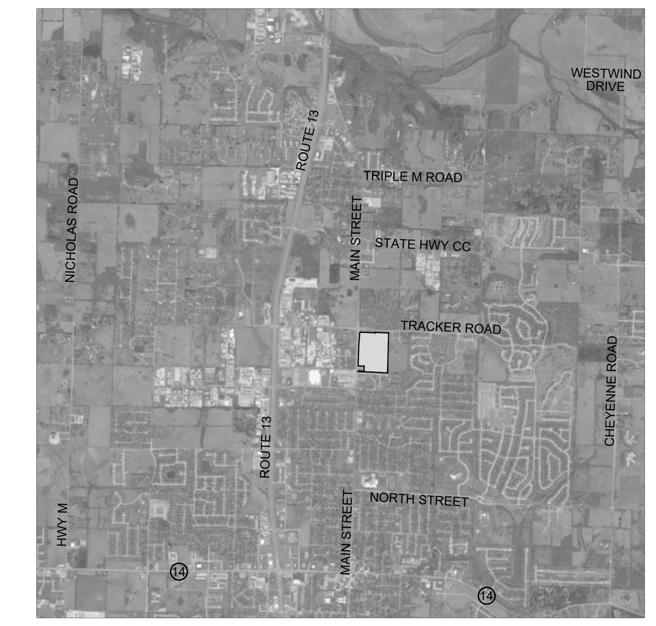
PHYSICAL EVIDENCE OF IMPROVEMENTS IS SHOWN FROM INFORMATION TAKEN BY VISUAL INSPECTION OF THE PREMISES. EASEMENTS SHOWN ARE THOSE WRITTEN, PROVIDED, OR DISCOVERED AND MAY NOT BE ALL INCLUSIVE. APPARENT OWNERSHIPS AS SHOWN ARE BASED UPON INFORMATION PROVIDED BY OTHERS AND DO NOT REPRESENT AN OPINION AS TO TITLE. THIS PRELIMINARY PLAT IS INTENDED FOR REVIEW AND PLANNING PURPOSES ONLY AND IS NOT TO BE USED BY ANYONE FOR CONVEYANCE OF LANDS OR TITLE OF REAL ESTATE.

EASEMENT VACATION

BY APPROVAL OF THE FINAL PLAT OF WALKER ESTATES SUBDIVISION BY THE CITY OF NIXA ALL EXISTING PUBLIC UTILITY EASEMENTS AND PUBLIC ROAD RIGHT-OF-WAY (OF RECORD OR NOT OF RECORD) LOCATED WITHIN THE BOUNDARY OF SAID SUBDIVISION BUT NOT SPECIFICALLY CALLED OUT AND/OR GRAPHICALLY DEPICTED HEREON SHALL HENCEFORTH BECOME ABANDONED, DISSOLVED AND VACATED. ANY EXISTING UTILITY STRUCTURE, LINE OR APPURTENANCE REGARDLESS OF TYPE LOCATED WITHIN ANY HEREINAFTER VACATED EASEMENT OR RIGHT-OF-WAY MAY REMAIN IN PLACE UNTIL SUCH TIME AS REPAIR, UPGRADE OR RELOCATION BECOME NECESSARY. ONCE REPAIR, UPGRADE OR RELOCATION BECOME NECESSARY SAID UTILITY STRUCTURE MUST BE RELOCATED INTO ONE OF THE NEWLY ESTABLISHED EASEMENTS DEPICTED HEREON.

COMMON AREA

COMMON AREAS DEPICTED ON THIS SUBDIVISION PLAT AS LOTS C1 THROUGH C2 SHALL BE CONVEYED IN FEE-TITLE TO THE HOME OWNERS ASSOCIATION FOR SAID SUBDIVISION FOLLOWING COMPLETION OF CONSTRUCTION AND THE RECORDING OF FINAL PLAT THEREOF. THESE COMMON AREAS ARE HEREAFTER RESTRICTED FROM ADDITIONAL SUBDIVIDING OR FROM THE CONSTRUCTION AND/OR ERECTION OF ANY STRUCTURE WHETHER PERMANENT OR TEMPORARY. THESE AREAS ARE TO BE RESERVED AND SET ASIDE IN PERPETUITY AS "GREEN SPACE", THE ONLY PERMITTED USE OF SAID AREAS BEING THE INSTALLATION OF LANDSCAPING, INCLUDING THE PLANTING OF TREES, AND GENERAL MAINTENANCE ACTIVITIES SUCH AS MOWING AND DEBRIS REMOVAL. ALL TAXES, EXPENSES AND OTHER COST RELATED TO THESE COMMON AREAS ARE THE SOLE RESPONSIBILITY OF THE HOMEOWNERS ASSOCIATION.



LOCATION MAP
SCALE: 1" = 5000'

PROPERTY DESCRIPTION

ALL THAT PART OF THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 12 - TOWNSHIP 27 NORTH - RANGE 22 WEST OF THE FIFTH PRINCIPAL MERIDIAN, CHRISTIAN COUNT, STATE OF MISSOURI, DESCRIBED AS FOLLOWS: COMMENCING AT THE SOUTHWEST CORNER OF SAID NORTHEAST QUARTER OF THE NORTHWEST QUARTER AND MEASURE S87°09'29"E ALONG THE SOUTH LINE THEREOF 46.72 FEET TO A POINT ON THE EAST RIGHT OF WAY LINE OF MAIN STREET FOR THE POINT OF BEGINNING; THENCE N01°44'33"E ALONG SAID EAST RIGHT OF WAY LINE 10.00 FEET TO A POINT ON THE SOUTH LINE OF THAT TRACT OF LAND DESCRIBED IN BOOK 2017 ON PAGE 9466; THENCE S87°14'38"E ALONG SAID SOUTH LINE 200.29 FEET TO THE SOUTHEAST CORNER THEREOF: THENCE N01°44'45"W ALONG THE EAST LINE THEREOF 172.00 FEET TO THE NORTHEAST CORNER THEREOF; THENCE N87°13'12"W ALONG THE NORTH LINE THEREOF 200.30 FEET TO A POINT ON THE EAST RIGHT OF WAY LINE OF MAIN STREET; (THE FOLLOWING FOLLOWS THE EAST R/W OF MAIN STREET) THENCE N01°44'41"E 487.33 FEET; THENCE N01°45'40"E 271.99 FEET; THENCE N07°27'19"E 140.43 FEET; THENCE N02°24'42"E 189.27 FEET; THENCE N47°20'09"E 35.05 FEET TO A POINT ON THE SOUTH RIGHT OF WAY LINE OF TRACKER ROAD; (THE FOLLOWING FOLLOWS THE SOUTH R/W OF TRACKER ROAD) THENCE S87°03'09"E 476.06 FEET; THENCE N02°49'33"E 16.69 FEET; THENCE S87°11'50"E 452.72 FEET TO A POINT MARKING THE NORTHEAST CORNER OF THE WEST 350 FEET OF THE EAST HALF OF THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER; THENCE S01°36'27"W ALONG THE EAST LINE THEREOF 1311.90 FEET TO THE SOUTHEAST CORNER THEREOF, SAID POINT ON THE SOUTH LINE OF SAID NORTHEAST QUARTER OF THE NORTHWEST QUARTER; THENCE N87°09'29"W 973.52 FEET TO THE POINT OF BEGINNING, CONTAINING 28.17 ACRES.

DATE OF PRELIMINARY PLAT SUBMITTAL: JUNE 18, 2021

TOTAL ACREAGE OF THE DEVELOPMENT: 28.17

TOTAL NUMBER OF LOTS: 28

CURRENT ZONING: R-1 (SINGLE FAMILY RESIDENTIAL DISTRICT)
GC (GENERAL COMMERCIAL)
R-3 (HIGH-DENSITY MULTI-FAMILY)

PROPOSED ZONING: R-1 (SINGLE FAMILY RESIDENTIAL DISTRICT)
GC (GENERAL COMMERCIAL)
R-3 (HIGH-DENSITY MULTI-FAMILY)

R-1 SMALLEST LOT: LOT 13, 7,497 SQUARE FEET

R-1 LARGEST LOT: LOT 16, 15,077 SQUARE FEET

NOTES

1. MINIMUM LOT WIDTH IS 60 FEET FOR R-1 (SINGLE FAMILY RESIDENTIAL DISTRICT).
2. MINIMUM LOT WIDTH IS NONE FOR GC (GENERAL COMMERCIAL).
3. MINIMUM LOT SIZE IS 6,600 SQUARE FEET.
4. R-1 (SINGLE FAMILY RESIDENTIAL DISTRICT)
   25 FOOT BUILDING SETBACK LINE IN THE FRONT OF ALL LOTS.
   20 FOOT BUILDING SETBACK LINE IN THE REAR OF ALL LOTS.
   5 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS.
   12 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS WITH LOCAL STREET FRONTAGE.
5. GC (GENERAL COMMERCIAL)
   20 FOOT BUILDING SETBACK LINE IN THE FRONT OF ALL LOTS.
   20 FOOT BUILDING SETBACK LINE IN THE REAR OF ALL LOTS.
   10 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS.
   15 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS WITH LOCAL STREET FRONTAGE.
6. R-3 (HIGH-DENSITY MULTI-FAMILY)
   20 FOOT BUILDING SETBACK LINE IN THE FRONT OF ALL LOTS.
   12 FOOT BUILDING SETBACK LINE IN THE REAR OF ALL LOTS.
   8 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS.
   12 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS WITH LOCAL STREET FRONTAGE.
7. 10 FOOT UTILITY EASEMENT ON FRONT AND REAR OF ALL LOTS.
8. ROADS ARE TO BE DEDICATED FOR THE USE OF THE PUBLIC.
9. COMMON AREA (C1 & C2), ARE TO BE COMMON AREA.
10. PRELIMINARY SINKHOLE FLOOD OUTLINE FOR THE 100-YEAR FLOOD. SEE FLOOD PLAIN NOTE THIS SHEET.
11. PRELIMINARY SINKHOLE FLOOD OUTLINE FOR THE 500-YEAR FLOOD. SEE FLOOD PLAIN NOTE THIS SHEET.
12. APPROXIMATE LOCATION OF PROPOSED FIRE HYDRANT (TYPICAL).
13. APPROXIMATE LOCATION OF PROPOSED DETENTION AREAS (TYPICAL).
14. ROADS, UTILITIES AND OTHER ENGINEERING DESIGN ITEMS ARE SHOWN HEREON FOR PLANNING PURPOSES ONLY AND WILL BE DESIGNED SEPARATELY BY LICENSED ENGINEER.
15. NO DIRECT ACCESS TO TRACKER ROAD OR MAIN STREET FROM ADJOINING LOTS. ALL LOT ACCESS MUST BE FROM ADJOINING STREETS WITHIN SUBDIVISION INTERIOR.
16. THIS SUBDIVISION INCLUDES A REPLAT OF THAT PORTION OF NORTH SIDE INDUSTRIAL PARK INCLUDING NECESSARY VACATION OF ROADWAYS, EASEMENTS AND ALL COVENANTS / RESTRICTIONS ASSOCIATED THEREWITH.

BASIS OF BEARING

MISSOURI STATE PLANE
NAD 83 CENTRAL ZONE

VERTICAL DATUM = NAVD1988

N

0 50 100

NOTE: DRAWING REPRODUCTION AND SCALING MAY CHANGE THE INDICATED GRAPHIC SCALES
H. SCALE: 1" = 100'

MISSOURI ONE CALL SYSTEM
Call or Click Before You Dig!
1-800-DIG-RITE or 811
mo1call.com

#	REVISION	DATE

JOSEPH R. PULLIAM - LAND SURVEYOR
MO# PLS-2006016641

DWN. BY: BJS
CKD. BY: DCG
APPD. BY: JRP
DATE: 06/18/2021
SCALE: 1" = 100'
Graphic scale may change due to drawing reproduction

TOTH & ASSOCIATES
1550 E. REPUBLIC ROAD
SPRINGFIELD, MO 65804
Ph: 417-888-0645 Fax: 417-888-0657
www.tothassociates.com
CERTIFICATE OF AUTHORITY:
MO# LS-2011008797
© 2021 Toth and Associates, Inc.
Drawings and specifications are not intended for use on other projects at this site or other sites without written approval of the engineer

PROJECT: WALKER ESTATES SUBDIVISION
LOCATION: CHRISTIAN COUNTY, MISSOURI
CLIENT: MORELOCK BUILDERS & ASSOCIATES
TITLE: PRELIMINARY PLAT

SHT NO: C-001

COUNCIL BILL EXHIBIT A - ATTACHMENT 1

ENGINEER'S REPORT

WALKER ESTATES AND WALKER WOODS SUBDIVISION

CITY OF NIXA, MISSOURI | SUMMER 2021

TOTH & ASSOCIATES

1550 E. REPUBLIC ROAD | SPRINGFIELD, MO 65804 | 417.888.0645
107 SE WASHINGTON ST | SUITE 465 | PORTLAND, OR 97214 | 503.946.6440
369 W HERMISTON AVE | HERMISTON, OR 97838 | 541-289-7000
TOTHASSOCIATES.COM

TABLE OF CONTENTS

INTRODUCTION 1
A. STORMWATER DRAINAGE 1
1. Existing Conditions 1
2. Stormwater Improvements 1
3. Detention 1
a. Detention Basins 1
b. Detention Volume 1
B. WATER SUPPLY 1
1. Design Flows 2
C. ELECTRICAL SUPPLY 2
D. OTHER UTILITIES 2
E. WASTEWATER DISPOSAL 2
1. Design Flows 2
2. Hydraulic Design 2
3. BOD 3
F. STREET IMPROVEMENTS 3
1. Subdivision Streets 3
2. Transportation Impact Study 3
G. PRELIMINARY PLAT 3

EXHIBIT 1: WALKER WOODS SUBDIVISION PRELIMINARY PLAT
EXHIBIT 2: WALKER ESTATES SUBDIVISION PRELIMINARY PLAT

TOTH & ASSOCIATES

INTRODUCTION

Walker Woods is a proposed 54 lot single family residential and 2 lot general commercial subdivision located at the northeast corner of the intersection of Main Street and Tracker Road in Nixa, Missouri. Walker Estates is a proposed 25 lot single family residential, 2 lot high-density multi-family, and single lot general commercial subdivision located at the southeast corner of the intersection of Main Street and Tracker Road in Nixa, Missouri. This Engineer's Report has been developed in accordance with the City of Nixa Technical Specification Manual. It summarizes the design of stormwater drainage, water, gas, electric and communications supply, wastewater disposal, traffic analysis, and planning data for the proposed subdivisions.

A. STORMWATER DRAINAGE

1. Existing Conditions

Based on topographic survey data and geotechnical investigation, stormwater currently flows primarily to one of ten of the sinkholes across the subject properties that are to be developed. The subject properties are currently undeveloped, and they have FEMA floodplains within some of the larger sinkholes, as shown on the Preliminary Plats. All runoff from the developable property drains to either a sinkhole or flows offsite to a drainage system.

2. Stormwater Improvements

The proposed subdivisions will have new 4-foot by 8-foot concrete curb inlets installed to address runoff in the right-of-way. The inlets will be spaced in compliance with City of Nixa design standards. Piping from the inlets that are placed under all paved areas will be reinforced concrete, and all other areas will utilize HDPE.

3. Detention

a. Detention Basins

Runoff from the site will be directed to multiple proposed storm water detention basins within a drainage area and near adjacent sinkholes. The basins will be sized to provide for both water quality and flood control. Flows from the basins will be released into adjacent sinkholes or into nearby storm systems at a rate less than the current undeveloped flow rates. This will ensure that individual sinkholes are not receiving excess runoff that could cause an increase in flood elevations in a post-development condition.

b. Detention Volume

The detention volume for the proposed subdivisions was calculated in compliance with the City of Nixa Technical Specification Manual. A 6-hour storm with a 25-year frequency was used to analyze stormwater runoff. The proposed subdivisions were delineated into drainage areas, and the curve numbers and times of concentration were calculated for each drainage area. The total estimated detention volume was then calculated by using HEC-1, producing a required volume of 258,300 cubic feet for the proposed subdivisions. Based on the initial layouts in the attached Preliminary Plats, the required value shall be achievable.

B. WATER SUPPLY

Water supply to the proposed subdivisions will be provided by the City of Nixa through multiple

connections to existing water mains on both the south side of Tracker Road and the west side of Main Street. Main lines will lie inside the right-of-way and service lines will run to each of the individual buildings and dwellings. Fire hydrants will be provided at each new intersection, at ends of mains, and spaced at 500 to 600 feet.

1. Design Flows

The design flows for this project are based on a full capacity of all residential units, houses, and businesses. A two person occupancy is assumed for each apartment unit. A 2.8 person occupancy is assumed for each single family house. A flow rate of 200 gallons per day per 1,000 square feet of floor area is assumed for commercial businesses. Flow Rate per person is estimated using a rate of 100 gallons per day. With a total of 79 single family dwellings, 95 apartment units, and 37,500 square feet of commercial businesses, the estimated average daily flow is equal to 48,700 gallons per day. Using a peaking factor of 4.00, the estimated peak daily flow is 194,800 gallons per day, giving a total flow of 135.3 gallons per minute.

C. ELECTRICAL SUPPLY

Electrical utilities for the proposed subdivisions will be provided by City of Nixa and will be underground.

D. OTHER UTILITIES

All other utilities (i.e. Natural Gas, Communication, Trash Services, etc.) for the proposed subdivisions will be provided by current utility providers that provide services inside the City of Nixa.

E. WASTEWATER DISPOSAL

The proposed subdivisions will be served with sewer by the City of Nixa through connection to an existing 8-inch public sewer main that crosses Tracker Road on the east side of the intersection with Main Street. New sewer mains will be extended to provide service line connections to each set of buildings and residential homes. Sewer from Walker Woods Subdivision will be directed to the existing manhole located at the northeast corner of the intersection of Main Street and Tracker Road, and sewer from Walker Estates Subdivision will be directed to the existing manhole located at the southeast corner of the intersection of Main Street and Tracker Road. Design flows from the anticipated number of units is provided below.

1. Design Flows

2. The design flows for this project are based on a full capacity of all residential units, houses, and businesses. A two person occupancy is assumed for each apartment unit. A 2.8 person occupancy is assumed for each single family house. A flow rate of 200 gallons per day per 1,000 square feet of floor area is assumed for commercial businesses. Flow Rate per person is estimated using a rate of 100 gallons per day. With a total of 79 single family dwellings, 95 apartment units, and 37,500 square feet of commercial businesses, the estimated average daily flow is equal to 48,700 gallons per day. Using a peaking factor of 4.00, the estimated peak daily flow is 194,800 gallons per day, giving a total flow of 135.3 gallons per minute.

3. Hydraulic Design

The hydraulic design for this project is based on a full capacity of the proposed PVC (n = 0.011) sewer line, with a minimum slope of 0.5 percent. Using the Manning equation, the flow capacity in the 8-inch sewer main is 453 gallons per minute.

4. BOD

The BOD for this project is based on a loading of 0.22 pounds of BOD per person per day. From the design flows, a population equivalent was calculated to be 487. Using these values, the total BOD is estimated to be 107.1 pounds of BOD per day.

F. STREET IMPROVEMENTS

1. Subdivision Streets

The proposed subdivisions will have dedicated public streets designed to City of Nixa standards. Right-of-way is being provided to meet city requirements with a width of 50 feet. All streets will be new with a width of 27 feet (back of curb to back of curb). Storm inlets and drainage piping will be included with street design that will be designed to the City of Nixa standards. Sidewalks will also be installed in accordance with City of Nixa standards.

2. Transportation Impact Study

Based on the Transportation Impact Study, a recommendation has been made to install required pavement and striping for turn lanes at the following 3 intersections: Main Street and Mandy Lane, Donald Street and Tracker Road, and Maxine Avenue and Tracker Road. Please refer to Transportation Impact Study dated June 18, 2021, to see the detailed analysis and recommendation.

G. PRELIMINARY PLAT

The Preliminary Plats for both subdivisions were laid out in accordance with the City of Nixa standards and have each been signed by a Professional Land Surveyor licensed in the state of Missouri. Copies of each Preliminary Plat are included in this report as Exhibits 1 and 2.

EXHIBITS

1. WALKER WOODS SUBDIVISION PRELIMINARY PLAT
2. WALKER ESTATES SUBDIVISION PRELIMINARY PLAT

TOTH & ASSOCIATES

EXHIBIT 1

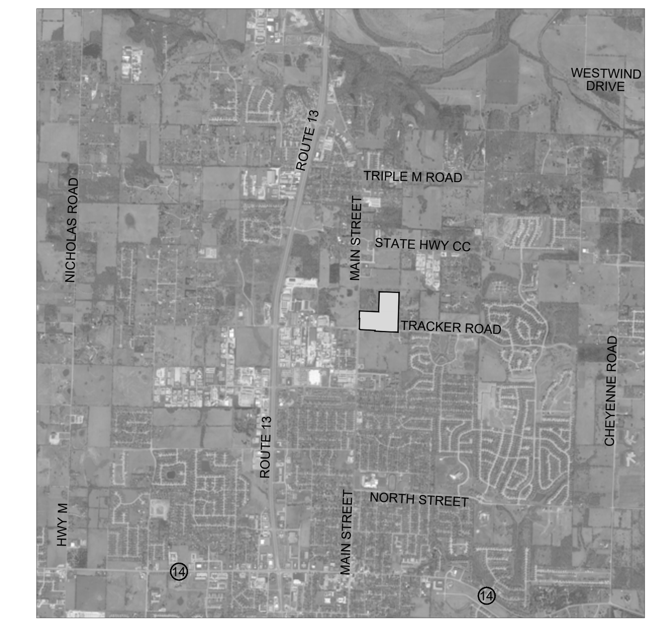
PRELIMINARY PLAT
WALKER WOODS SUBDIVISION

A SUBDIVISION IN THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 1, TOWNSHIP 27 NORTH, RANGE 22 WEST OF THE FIFTH PRINCIPAL MERIDIAN, CITY OF NIXA, CHRISTIAN COUNTY, STATE OF MISSOURI.

OWNER: DON E. WALKER AND LOIS M. WALKER

DEVELOPER: MORELOCK BUILDERS & ASSOCIATES

722 W. OLIVE STREET
SPRINGFIELD, MISSOURI 65806



LOCATION MAP
SCALE: 1" = 5000'

PROPERTY DESCRIPTION

ALL THAT PART OF THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 1 - TOWNSHIP 27 NORTH - RANGE 22 WEST OF THE FIFTH PRINCIPAL MERIDIAN, CHRISTIAN COUNT, STATE OF MISSOURI, DESCRIBED AS FOLLOWS: COMMENCING AT THE SOUTHEAST CORNER OF SAID SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER AND MEASURE N01°44'43"E ALONG THE EAST LINE THEREOF 1328.70 FEET TO THE NORTHEAST CORNER THEREOF; THENCE N87°47'06"W ALONG THE NORTH LINE THEREOF 15.0 FEET TO THE POINT OF BEGINNING; THENCE S01°44'43"W 1308.54 FEET TO A POINT ON THE NORTH RIGHT OF WAY LINE OF TRACKER ROAD; (THE FOLLOWING FOLLOWS THE NORTH R/W OF TRACKER ROAD) THENCE N87°10'30"W 754.49 FEET; THENCE N02°59'28"E 23.57 FEET; THENCE N87°04'01"W 490.18 FEET; THENCE N42°51'10"W 35.82 FEET TO A POINT ON THE EAST RIGHT OF WAY LINE OF MAIN STREET; (THE FOLLOWING FOLLOWS THE EAST R/W OF MAIN STREET) THENCE N01°27'03"E 339.90 FEET; THENCE N88°07'29"W 13.97 FEET; THENCE N02°01'18"E 242.62 FEET TO A POINT ON THE SOUTH LINE OF THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER; THENCE S87°30'09"E ALONG THE SOUTH LINE THEREOF 631.22 FEET TO THE SOUTHEAST CORNER THEREOF; THENCE N01°45'07"E ALONG THE EAST LINE THEREOF 661.06 FEET TO THE NORTHEAST CORNER THEREOF; THENCE S87°47'06"E ALONG THE NORTH LINE OF THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER 652.40 FEET TO THE POINT OF BEGINNING, CONTAINING 28.39 ACRES.

DATE OF PRELIMINARY PLAT SUBMITTAL: JUNE 18, 2021

TOTAL ACREAGE OF THE DEVELOPMENT: 28.39

TOTAL NUMBER OF LOTS: 56

CURRENT ZONING: R-1 (SINGLE FAMILY RESIDENTIAL DISTRICT)
GC (GENERAL COMMERCIAL)

PROPOSED ZONING: R-1 (SINGLE FAMILY RESIDENTIAL DISTRICT)
GC (GENERAL COMMERCIAL)

R-1 SMALLEST LOT: LOT 12, 10,000 SQUARE FEET

R-1 LARGEST LOT: LOT 20, 20,611 SQUARE FEET

NOTES

1. MINIMUM LOT WIDTH IS 60 FEET FOR R-1 (SINGLE FAMILY RESIDENTIAL DISTRICT).
2. MINIMUM LOT WIDTH IS NONE FOR GC (GENERAL COMMERCIAL).
3. MINIMUM LOT SIZE IS 6,600 SQUARE FEET.
4. R-1 (SINGLE FAMILY RESIDENTIAL DISTRICT)
   25 FOOT BUILDING SETBACK LINE IN THE FRONT OF ALL LOTS.
   20 FOOT BUILDING SETBACK LINE IN THE REAR OF ALL LOTS.
   5 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS.
   12 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS WITH LOCAL STREET FRONTAGE.
5. GC (GENERAL COMMERCIAL)
   20 FOOT BUILDING SETBACK LINE IN THE FRONT OF ALL LOTS.
   20 FOOT BUILDING SETBACK LINE IN THE REAR OF ALL LOTS.
   10 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS.
   15 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS WITH LOCAL STREET FRONTAGE.
6. ROADS ARE TO BE DEDICATED FOR THE USE OF THE PUBLIC.
7. 10 FOOT UTILITY EASEMENT ON FRONT AND REAR OF ALL LOTS.
8. COMMON AREA (C1, C2, C3 & C4), ARE TO BE COMMON AREA.
9. APPROXIMATE LOCATION OF PROPOSED FIRE HYDRANT (TYPICAL).
10. PRELIMINARY SINKHOLE FLOOD OUTLINE FOR THE 100-YEAR FLOOD. SEE FLOOD PLAIN NOTE THIS SHEET.
11. PRELIMINARY SINKHOLE FLOOD OUTLINE FOR THE 500-YEAR FLOOD. SEE FLOOD PLAIN NOTE THIS SHEET.
12. APPROXIMATE LOCATION OF PROPOSED DETENTION AREAS (TYPICAL).
13. ROADS, UTILITIES AND OTHER ENGINEERING DESIGN ITEMS ARE SHOWN HEREON FOR PLANNING PURPOSES ONLY AND WILL BE DESIGNED SEPARATELY BY LICENSED ENGINEER.
14. PRE-EXISTING STRUCTURE LOCATED ON LOTS 21 AND 22 EXEMPT FROM SETBACK REQUIREMENTS UNTIL SUCH TIME AS STRUCTURE IS REMOVED, ALL NEW STRUCTURES MUST CONFORM TO LOT SETBACKS.
15. NO DIRECT ACCESS TO TRACKER ROAD OR MAIN STREET FROM ADJOINING LOTS. ALL LOT ACCESS MUST BE FROM ADJOINING STREETS WITHIN SUBDIVISION INTERIOR.

FLOOD NOTE

BY GRAPHIC PLOTTING ONLY, THIS PROPERTY IS IN ZONE X OF THE FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NO. 29043C0060C, WHICH BEARS AN EFFECTIVE DATE OF DECEMBER 17, 2010.

THE SINKHOLE FLOOD OUTLINES SHOWN FOR THE 100-YEAR AND 500-YEAR FLOODPLAINS ARE BASED ON THE PRELIMINARY FIRM PANEL 29043C0058D, WITH A PRELIMINARY DATE OF 2019/09/20 AND ARE USED AS A REFERENCE ONLY.

DECLARATION BY SURVEYOR

I, JOSEPH R. PULLIAM, DO HEREBY CERTIFY THAT THIS PRELIMINARY PLAT WAS PREPARED UNDER MY PERSONAL SUPERVISION FROM AN ACTUAL SURVEY OF THE LAND HEREIN, IN ACCORDANCE WITH THE CURRENT MISSOURI STANDARDS FOR PROPERTY BOUNDARY SURVEYS.

PHYSICAL EVIDENCE OF IMPROVEMENTS IS SHOWN FROM INFORMATION TAKEN BY VISUAL INSPECTION OF THE PREMISES. EASEMENTS SHOWN ARE THOSE WRITTEN, PROVIDED, OR DISCOVERED AND MAY NOT BE ALL INCLUSIVE. APPARENT OWNERSHIPS AS SHOWN ARE BASED UPON INFORMATION PROVIDED BY OTHERS AND DO NOT REPRESENT AN OPINION AS TO TITLE. THIS PRELIMINARY PLAT IS INTENDED FOR REVIEW AND PLANNING PURPOSES ONLY AND IS NOT TO BE USED BY ANYONE FOR CONVEYANCE OF LANDS OR TITLE OF REAL ESTATE.

COMMON AREA

COMMON AREAS DEPICTED ON THIS SUBDIVISION PLAT AS LOTS C1 THROUGH C4 SHALL BE CONVEYED IN FEE-TITLE TO THE HOME OWNERS ASSOCIATION FOR SAID SUBDIVISION FOLLOWING COMPLETION OF CONSTRUCTION AND THE RECORDING OF FINAL PLAT THEREOF. THESE COMMON AREAS ARE HEREAFTER RESTRICTED FROM ADDITIONAL SUBDIVIDING OR FROM THE CONSTRUCTION AND/OR ERECTION OF ANY STRUCTURE WHETHER PERMANENT OR TEMPORARY. THESE AREAS ARE TO BE RESERVED AND SET ASIDE IN PERPETUITY AS "GREEN SPACE", THE ONLY PERMITTED USE OF SAID AREAS BEING THE INSTALLATION OF LANDSCAPING, INCLUDING THE PLANTING OF TREES, AND GENERAL MAINTENANCE ACTIVITIES SUCH AS MOWING AND DEBRIS REMOVAL. ALL TAXES, EXPENSES AND OTHER COST RELATED TO THESE COMMON AREAS ARE THE SOLE RESPONSIBILITY OF THE HOMEOWNERS ASSOCIATION.

SINGLE FAMILY RESIDENTIAL DISTRICT

LOT #	SQ. FT.	AC.
1	10,047	0.23
2	10,010	0.23
3	11,440	0.26
4	11,440	0.26
5	11,356	0.26
6	14,074	0.32
7	13,396	0.31
8	12,758	0.29
9	13,842	0.32
10	10,010	0.23
11	10,010	0.23
12	10,000	0.23
13	15,384	0.35
14	11,416	0.26
15	8,925	0.20
16	9,608	0.22
17	10,673	0.25
18	10,220	0.23

SINGLE FAMILY RESIDENTIAL DISTRICT

LOT #	SQ. FT.	AC.
19	16,548	0.38
20	20,611	0.47
21	10,010	0.23
22	10,010	0.23
23	15,259	0.35
24	10,886	0.25
25	10,010	0.23
26	10,970	0.25
27	12,373	0.28
28	16,187	0.37
29	16,812	0.39
30	11,354	0.26
31	11,507	0.26
32	11,520	0.26
33	11,520	0.26
34	11,520	0.26
35	11,520	0.26
36	12,022	0.28

SINGLE FAMILY RESIDENTIAL DISTRICT

LOT #	SQ. FT.	AC.
37	13,898	0.32
38	12,284	0.28
39	12,493	0.29
40	14,007	0.32
41	14,984	0.34
42	10,010	0.23
43	10,010	0.23
44	10,578	0.24
45	11,175	0.26
46	11,018	0.25
47	9,724	0.22
48	9,724	0.22
49	9,724	0.22
50	9,724	0.22
51	9,724	0.22
52	9,724	0.22
53	9,724	0.22
54	9,857	0.23

GENERAL COMMERCIAL

LOT #	SQ. FT.	AC.
GC1	55,264	1.27
GC2	44,979	1.03

COMMON AREA

LOT #	SQ. FT.	AC.
C1	25,676	0.59
C2	83,615	1.92
C3	85,198	1.96
C4	149,140	3.42

LEGEND

- ADJOINING PROPERTY LINE
- UTILITY EASEMENT LINE
- SETBACK LINE
- SINKHOLE BOUNDARY
- SINKHOLE (NO CONSTRUCTION LIMITS)

BASIS OF BEARING

MISSOURI STATE PLANE
NAD 83 CENTRAL ZONE

VERTICAL DATUM = NAVD1988

N

0 50 100

NOTE: DRAWING REPRODUCTION AND SCALING MAY CHANGE THE INDICATED GRAPHIC SCALES

H. SCALE: 1" = 100'

MISSOURI ONE CALL SYSTEM
Call or Click Before You Dig!
1-800-DIG-RITE or 811
mo1call.com

#	REVISION	DATE

STATE OF MISSOURI — JOSEPH R. PULLIAM — NUMBER PLS-2006016641 — PROFESSIONAL LAND SURVEYOR — 06/17/2021

JOSEPH R. PULLIAM - LAND SURVEYOR
MO# PLS-2006016641

DWN. BY: BJS | CKD. BY: DCG | APPD. BY: JRP | DATE: 06/18/2021 | SCALE: 1" = 100'

Graphic scale may change due to drawing reproduction

TOTH & ASSOCIATES
1550 E. REPUBLIC ROAD
SPRINGFIELD, MO 65804
Ph: 417-888-0645 Fax: 417-888-0657
www.tothassociates.com
CERTIFICATE OF AUTHORITY: MO# LS-2011008797

© 2021 Toth and Associates, Inc.

Drawings and specifications are not intended for use on other projects at this site or other sites without written approval of the engineer

PROJECT: WALKER WOODS SUBDIVISION

LOCATION: CHRISTIAN COUNTY, MISSOURI

CLIENT: MORELOCK BUILDERS & ASSOCIATES

TITLE: PRELIMINARY PLAT

SHT NO: C-001

EXHIBIT 2

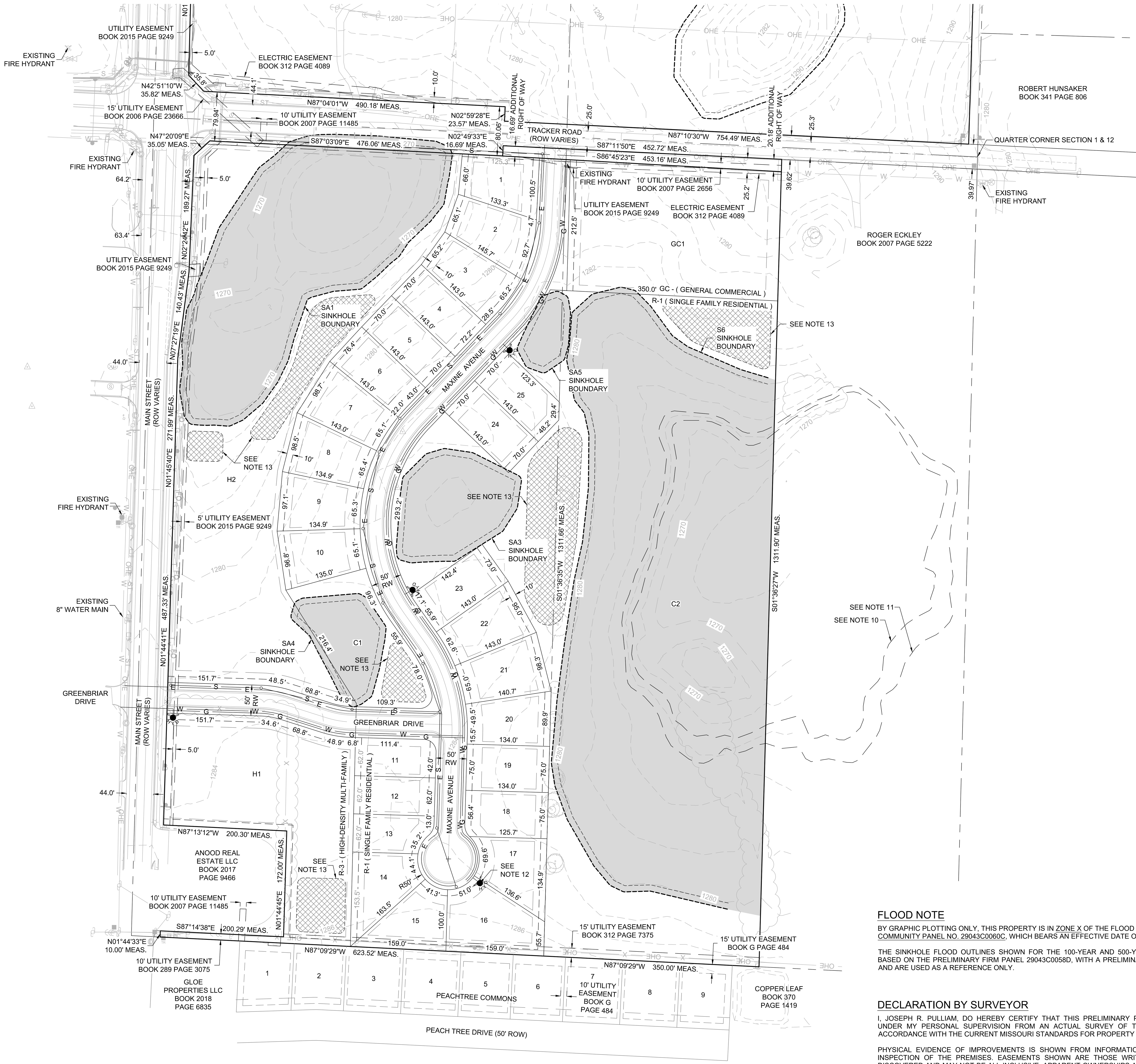
PRELIMINARY PLAT
WALKER ESTATES SUBDIVISION

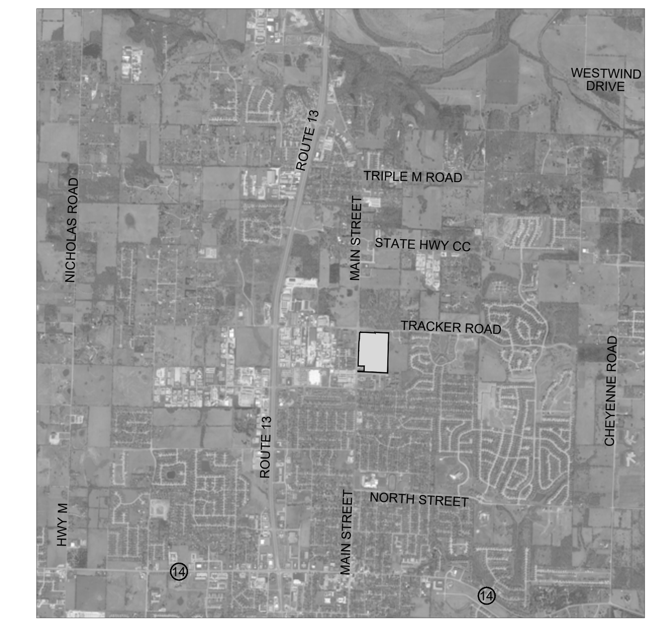
A SUBDIVISION IN THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 12, TOWNSHIP 27 NORTH, RANGE 22 WEST OF THE FIFTH PRINCIPAL MERIDIAN, CITY OF NIXA, CHRISTIAN COUNTY, STATE OF MISSOURI.

OWNER: DON E. WALKER AND LOIS M. WALKER

DEVELOPER: MORELOCK BUILDERS & ASSOCIATES

722 W. OLIVE STREET
SPRINGFIELD, MISSOURI 65806





LOCATION MAP
SCALE: 1" = 5000'

PROPERTY DESCRIPTION

ALL THAT PART OF THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 12 - TOWNSHIP 27 NORTH - RANGE 22 WEST OF THE FIFTH PRINCIPAL MERIDIAN, CHRISTIAN COUNT, STATE OF MISSOURI, DESCRIBED AS FOLLOWS: COMMENCING AT THE SOUTHWEST CORNER OF SAID NORTHEAST QUARTER OF THE NORTHWEST QUARTER AND MEASURE S87°09'29"E ALONG THE SOUTH LINE THEREOF 46.72 FEET TO A POINT ON THE EAST RIGHT OF WAY LINE OF MAIN STREET FOR THE POINT OF BEGINNING; THENCE N01°44'33"E ALONG SAID EAST RIGHT OF WAY LINE 10.00 FEET TO A POINT ON THE SOUTH LINE OF THAT TRACT OF LAND DESCRIBED IN BOOK 2017 ON PAGE 9466; THENCE S87°14'38"E ALONG SAID SOUTH LINE 200.29 FEET TO THE SOUTHEAST CORNER THEREOF: THENCE N01°44'45"W ALONG THE EAST LINE THEREOF 172.00 FEET TO THE NORTHEAST CORNER THEREOF; THENCE N87°13'12"W ALONG THE NORTH LINE THEREOF 200.30 FEET TO A POINT ON THE EAST RIGHT OF WAY LINE OF MAIN STREET; (THE FOLLOWING FOLLOWS THE EAST R/W OF MAIN STREET) THENCE N01°44'41"E 487.33 FEET; THENCE N01°45'40"E 271.99 FEET; THENCE N07°27'19"E 140.43 FEET; THENCE N02°24'42"E 189.27 FEET; THENCE N47°20'09"E 35.05 FEET TO A POINT ON THE SOUTH RIGHT OF WAY LINE OF TRACKER ROAD; (THE FOLLOWING FOLLOWS THE SOUTH R/W OF TRACKER ROAD) THENCE S87°03'09"E 476.06 FEET; THENCE N02°49'33"E 16.69 FEET; THENCE S87°11'50"E 452.72 FEET TO A POINT MARKING THE NORTHEAST CORNER OF THE WEST 350 FEET OF THE EAST HALF OF THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER; THENCE S01°36'27"W ALONG THE EAST LINE THEREOF 1311.90 FEET TO THE SOUTHEAST CORNER THEREOF, SAID POINT ON THE SOUTH LINE OF SAID NORTHEAST QUARTER OF THE NORTHWEST QUARTER; THENCE N87°09'29"W 973.52 FEET TO THE POINT OF BEGINNING, CONTAINING 28.17 ACRES.

DATE OF PRELIMINARY PLAT SUBMITTAL:	JUNE 18, 2021
TOTAL ACREAGE OF THE DEVELOPMENT:	28.17
TOTAL NUMBER OF LOTS:	28
CURRENT ZONING:	R-1 (SINGLE FAMILY RESIDENTIAL DISTRICT) GC (GENERAL COMMERCIAL) R-3 (HIGH-DENSITY MULTI-FAMILY)
PROPOSED ZONING:	R-1 (SINGLE FAMILY RESIDENTIAL DISTRICT) GC (GENERAL COMMERCIAL) R-3 (HIGH-DENSITY MULTI-FAMILY)
R-1 SMALLEST LOT:	LOT 13, 7,497 SQUARE FEET
R-1 LARGEST LOT:	LOT 16, 15,077 SQUARE FEET

NOTES

1. MINIMUM LOT WIDTH IS 60 FEET FOR R-1 (SINGLE FAMILY RESIDENTIAL DISTRICT).
2. MINIMUM LOT WIDTH IS NONE FOR GC (GENERAL COMMERCIAL).
3. MINIMUM LOT SIZE IS 6,600 SQUARE FEET.
4. R-1 (SINGLE FAMILY RESIDENTIAL DISTRICT)
   25 FOOT BUILDING SETBACK LINE IN THE FRONT OF ALL LOTS.
   20 FOOT BUILDING SETBACK LINE IN THE REAR OF ALL LOTS.
   5 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS.
   12 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS WITH LOCAL STREET FRONTAGE.
5. GC (GENERAL COMMERCIAL)
   20 FOOT BUILDING SETBACK LINE IN THE FRONT OF ALL LOTS.
   20 FOOT BUILDING SETBACK LINE IN THE REAR OF ALL LOTS.
   10 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS.
   15 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS WITH LOCAL STREET FRONTAGE.
6. R-3 (HIGH-DENSITY MULTI-FAMILY)
   20 FOOT BUILDING SETBACK LINE IN THE FRONT OF ALL LOTS.
   12 FOOT BUILDING SETBACK LINE IN THE REAR OF ALL LOTS.
   8 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS.
   12 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS WITH LOCAL STREET FRONTAGE.
7. 10 FOOT UTILITY EASEMENT ON FRONT AND REAR OF ALL LOTS.
8. ROADS ARE TO BE DEDICATED FOR THE USE OF THE PUBLIC.
9. COMMON AREA (C1 & C2), ARE TO BE COMMON AREA.
10. PRELIMINARY SINKHOLE FLOOD OUTLINE FOR THE 100-YEAR FLOOD. SEE FLOOD PLAIN NOTE THIS SHEET.
11. PRELIMINARY SINKHOLE FLOOD OUTLINE FOR THE 500-YEAR FLOOD. SEE FLOOD PLAIN NOTE THIS SHEET.
12. APPROXIMATE LOCATION OF PROPOSED FIRE HYDRANT (TYPICAL).
13. APPROXIMATE LOCATION OF PROPOSED DETENTION AREAS (TYPICAL).
14. ROADS, UTILITIES AND OTHER ENGINEERING DESIGN ITEMS ARE SHOWN HEREON FOR PLANNING PURPOSES ONLY AND WILL BE DESIGNED SEPARATELY BY LICENSED ENGINEER.
15. NO DIRECT ACCESS TO TRACKER ROAD OR MAIN STREET FROM ADJOINING LOTS. ALL LOT ACCESS MUST BE FROM ADJOINING STREETS WITHIN SUBDIVISION INTERIOR.
16. THIS SUBDIVISION INCLUDES A REPLAT OF THAT PORTION OF NORTH SIDE INDUSTRIAL PARK INCLUDING NECESSARY VACATION OF ROADWAYS, EASEMENTS AND ALL COVENANTS / RESTRICTIONS ASSOCIATED THEREWITH.

FLOOD NOTE

BY GRAPHIC PLOTTING ONLY, THIS PROPERTY IS IN ZONE X OF THE FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NO. 29043C0060C, WHICH BEARS AN EFFECTIVE DATE OF DECEMBER 17, 2010.

THE SINKHOLE FLOOD OUTLINES SHOWN FOR THE 100-YEAR AND 500-YEAR FLOODPLAINS ARE BASED ON THE PRELIMINARY FIRM PANEL 29043C0058D, WITH A PRELIMINARY DATE OF 2019/09/20 AND ARE USED AS A REFERENCE ONLY.

DECLARATION BY SURVEYOR

I, JOSEPH R. PULLIAM, DO HEREBY CERTIFY THAT THIS PRELIMINARY PLAT WAS PREPARED UNDER MY PERSONAL SUPERVISION FROM AN ACTUAL SURVEY OF THE LAND HEREIN, IN ACCORDANCE WITH THE CURRENT MISSOURI STANDARDS FOR PROPERTY BOUNDARY SURVEYS.

PHYSICAL EVIDENCE OF IMPROVEMENTS IS SHOWN FROM INFORMATION TAKEN BY VISUAL INSPECTION OF THE PREMISES. EASEMENTS SHOWN ARE THOSE WRITTEN, PROVIDED, OR DISCOVERED AND MAY NOT BE ALL INCLUSIVE. APPARENT OWNERSHIPS AS SHOWN ARE BASED UPON INFORMATION PROVIDED BY OTHERS AND DO NOT REPRESENT AN OPINION AS TO TITLE. THIS PRELIMINARY PLAT IS INTENDED FOR REVIEW AND PLANNING PURPOSES ONLY AND IS NOT TO BE USED BY ANYONE FOR CONVEYANCE OF LANDS OR TITLE OF REAL ESTATE.

EASEMENT VACATION

BY APPROVAL OF THE FINAL PLAT OF WALKER ESTATES SUBDIVISION BY THE CITY OF NIXA ALL EXISTING PUBLIC UTILITY EASEMENTS AND PUBLIC ROAD RIGHT-OF-WAY (OF RECORD OR NOT OF RECORD) LOCATED WITHIN THE BOUNDARY OF SAID SUBDIVISION BUT NOT SPECIFICALLY CALLED OUT AND/OR GRAPHICALLY DEPICTED HEREON SHALL HENCEFORTH BECOME ABANDONED, DISSOLVED AND VACATED. ANY EXISTING UTILITY STRUCTURE, LINE OR APPURTENANCE REGARDLESS OF TYPE LOCATED WITHIN ANY HEREINAFTER VACATED EASEMENT OR RIGHT-OF-WAY MAY REMAIN IN PLACE UNTIL SUCH TIME AS REPAIR, UPGRADE OR RELOCATION BECOME NECESSARY. ONCE REPAIR, UPGRADE OR RELOCATION BECOME NECESSARY SAID UTILITY STRUCTURE MUST BE RELOCATED INTO ONE OF THE NEWLY ESTABLISHED EASEMENTS DEPICTED HEREON.

COMMON AREA

COMMON AREAS DEPICTED ON THIS SUBDIVISION PLAT AS LOTS C1 THROUGH C2 SHALL BE CONVEYED IN FEE-TITLE TO THE HOME OWNERS ASSOCIATION FOR SAID SUBDIVISION FOLLOWING COMPLETION OF CONSTRUCTION AND THE RECORDING OF FINAL PLAT THEREOF. THESE COMMON AREAS ARE HEREAFTER RESTRICTED FROM ADDITIONAL SUBDIVIDING OR FROM THE CONSTRUCTION AND/OR ERECTION OF ANY STRUCTURE WHETHER PERMANENT OR TEMPORARY. THESE AREAS ARE TO BE RESERVED AND SET ASIDE IN PERPETUITY AS “GREEN SPACE”, THE ONLY PERMITTED USE OF SAID AREAS BEING THE INSTALLATION OF LANDSCAPING, INCLUDING THE PLANTING OF TREES, AND GENERAL MAINTENANCE ACTIVITIES SUCH AS MOWING AND DEBRIS REMOVAL. ALL TAXES, EXPENSES AND OTHER COST RELATED TO THESE COMMON AREAS ARE THE SOLE RESPONSIBILITY OF THE HOMEOWNERS ASSOCIATION.

SINGLE FAMILY RESIDENTIAL DISTRICT

LOT #	SQ. FT.	AC.
1	10,602	0.24
2	11,613	0.27
3	11,613	0.27
4	10,170	0.23
5	10,009	0.23
6	10,069	0.23
7	11,540	0.26
8	11,192	0.26
9	10,789	0.25
10	10,758	0.25
11	8,057	0.18
12	8,129	0.19
13	7,497	0.17

SINGLE FAMILY RESIDENTIAL DISTRICT

LOT #	SQ. FT.	AC.
14	11,148	0.26
15	10,670	0.24
16	15,077	0.35
17	11,328	0.26
18	10,002	0.23
19	10,050	0.23
20	10,492	0.24
21	11,409	0.26
22	11,114	0.26
23	10,435	0.24
24	10,010	0.23
25	9,794	0.22

COMMON AREA

LOT #	SQ. FT.	AC.
C1	28,919	0.66
C2	448,246	10.29

GENERAL COMMERCIAL

LOT #	SQ. FT.	AC.
GC1	72,410	1.66

HIGH-DENSITY MULTI-FAMILY

LOT #	SQ. FT.	AC.
H1	75,979	1.74
H2	237,464	5.45

LEGEND

- ADJOINING PROPERTY LINE
- UTILITY EASEMENT LINE
- SETBACK LINE
- SINKHOLE BOUNDARY
- SINKHOLE (NO CONSTRUCTION LIMITS)

BASIS OF BEARING

MISSOURI STATE PLANE
NAD 83 CENTRAL ZONE

VERTICAL DATUM = NAVD1988

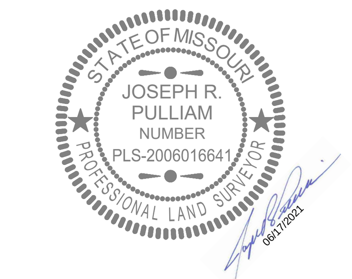
N

0 50 100

NOTE: DRAWING REPRODUCTION AND SCALING MAY CHANGE THE INDICATED GRAPHIC SCALES
H. SCALE: 1" = 100'

MISSOURI ONE CALL SYSTEM
Call or Click Before You Dig!
1-800-DIG-RITE or 811
mo1call.com

#	REVISION	DATE



JOSEPH R. PULLIAM - LAND SURVEYOR
MO# PLS-2006016641

DWN. BY: BJS
CKD. BY: DCG
APPD. BY: JRP
DATE: 06/18/2021
SCALE: 1" = 100'
Graphic scale may change due to drawing reproduction

TOTH & ASSOCIATES
1550 E. REPUBLIC ROAD
SPRINGFIELD, MO 65804
Ph: 417-888-0645 Fax: 417-888-0657
www.tothassociates.com
CERTIFICATE OF AUTHORITY:
MO# LS-2011008797
© 2021 Toth and Associates, Inc.
Drawings and specifications are not intended for use on other projects at this site or other sites without written approval of the engineer

PROJECT: WALKER ESTATES SUBDIVISION
LOCATION: CHRISTIAN COUNTY, MISSOURI
CLIENT: MORELOCK BUILDERS & ASSOCIATES
TITLE: PRELIMINARY PLAT

SHT NO: C-001

TOTH
& ASSOCIATES

COUNCIL BILL EXHIBIT A - ATTACHMENT 2

TRANSPORTATION IMPACT STUDY

WALKER ESTATES AND WALKER WOODS SUBDIVISION

CITY OF NIXA, MISSOURI | SUMMER 2021

TOTH & ASSOCIATES

1550 E. REPUBLIC ROAD | SPRINGFIELD, MO 65804 | 417.888.0645
107 SE WASHINGTON ST | SUITE 465 | PORTLAND, OR 97214 | 503.946.6440
369 W HERMISTON AVE | HERMISTON, OR 97838 | 541-289-7000
TOTHASSOCIATES.COM

TABLE OF CONTENTS

TRANSPORTATION IMPACT STUDY

1. EXECUTIVE SUMMARY
   - 1.1 Findings 1
   - 1.2 Recommendations 1

2. INTRODUCTION
   - 2.1 Purpose of Report 2
   - 2.2 Objectives 2
   - 2.3 Intersections Studied 3
   - 2.4 Location Map of Project 3

3. DEVELOPMENT SITE
   - 3.1 Existing Land Use 4
   - 3.2 Proposed Land Use 4
   - 3.3 Proposed Access Points 4
   - 3.4 Relationship to Current Plans 5
   - 3.5 Multimodal Evaluation 5
   - 3.6 Study Scenarios

4. EXISTING CONDITIONS
   - 4.1 Description of Key Roads 6
   - 4.2 Intersection Traffic Volumes and Turning Counts 6
   - 4.3 Available Bike and Pedestrian Infrastructure 11
   - 4.4 Available Transit Infrastructure 11

5. PROJECTED TRAFFIC
   - 5.1 Estimated Trip Generation and/or Relocated Traffic 12
   - 5.2 Trip Distribution and Assignment 13
   - 5.3 Map of Projected Directional Distribution 14
   - 5.4 Total Future Traffic (AM/PM) 16

6. CAPACITY ANALYSIS FOR THE STUDIED INTERSECTIONS
   - 6.1 Existing and Proposed Scenarios for AM/PM 44
   - 6.2 Existing/Future Level of Service 44

7. PARKING EVALUATION
   - 7.1 Parking to Be Provided on Site 46
   - 7.2 Parking Required by Nixa City Code 46

8. SIGHT DISTANCE REVIEW
   - 8.1 Minimum Stopping Sight Distances Required 47
   - 8.2 Stopping Sight Distances Provided 47
   - 8.3 Additional Recommendations 47

9. SIGHT REVIEW
9.1 MUTCD Standards 48
9.2 Site Circulation and Turning Templates 48
9.3 Site Conflicts 48

10. MAIN FINDINGS OF THE STUDY
10.1 Left Turn Warrant 49

11. SUMMARY OF FINDINGS AND RECOMMENDATIONS
11.1 Geometric and Lane Recommendations to Accommodate Proposed Traffic Volume 50

EXHIBITS

Exhibit 1: Walker Woods Preliminary Plat
Exhibit 2: Walker Estates Preliminary Plat
Exhibit 3: Walker Woods Autoturn Analysis
Exhibit 4: Walker Estates Autoturn Analysis
Exhibit 5: Proposed Turn Lane Improvements
Exhibit 6: OTO Major Thoroughfare Plan

APPENDICES

Appendix A: Cost Estimate
Appendix B: Collected Turning Movement Count Data
Appendix C: Capacity Calculations

1. EXECUTIVE SUMMARY

1.1 Findings

- The property at the northeast and southeast corners of Tracker Road and Main Street is owned by the Walker family and was recently annexed and rezoned for two proposed subdivisions: Walker Woods Subdivision (located north of Tracker Road) and Walker Estates Subdivision (located south of Tracker Road)

- Due to the fact that the proposed intersections from this development connect to roads classified as Collector or higher, it is the City of Nixa's policy to require a Transportation Impact Study to be completed.

- Based on current City of Nixa policy, the developer will be donating sufficient right of way (hereinafter referred to as ROW) along the properties adjacent to both Main Street and Tracker Road where existing ROW width is less than OTO standards per the individual classification of the road. Tracker Road is classified as a Secondary Arterial and Main Street is classified as a Collector, according to the OTO.

- Additionally it is also the City's policy to require the developer to make necessary lane improvements to any street classified as a Collector or higher, according to the adopted OTO Major Thoroughfare Plan 2040, when the development generates a new intersecting City Street.

- Results of this Transportation Impact Study will determine the geometry of the required left turn lanes at 3 of the 4 newly proposed intersections.

- The new road connecting Walker Estates to Main Street will not require mitigation, as Main Street has recently been improved to 3 lanes in that location.

1.2 Recommendations

It is our recommendation that the City of Nixa approve the conceptual design of the proposed improvements described within this Transportation Impact Study. The recommendations are summarized as follows:

- Install required pavement and striping for turn lanes at the following 3 intersections: Main Street and Mandy Lane, Donald Street and Tracker Road, and Maxine Avenue and Tracker Road.

2. INTRODUCTION

2.1 Purpose

Morelock Builders & Associates (hereinafter referred to as MBA) has secured the services of Toth & Associates to complete a transportation impact study related to their Client's proposed subdivision for implementing traffic solutions that are in accordance with the City of Nixa, Missouri and the Ozarks Transportation Organization (hereinafter referred to as the OTO). This Transportation Impact Study (hereinafter referred to as TIS) summarizes the existing and future traffic parameters and provides recommendations to alleviate growth related traffic issues over a planning period, as recommended by the OTO. This TIS is classified as a Level II TIS, based on the peak hourly generated trips being between 100 and 499 trips.

2.2 Objectives

The following summarized scope of work was completed in preparation of this TIS.

- Determine the impact that the proposed subdivisions will have on the area, specifically regarding traffic flows at the 5 studied intersections. The intersections studied include the existing intersections of Tracker Road and Main Street and the 4 newly created intersections due to both subdivision developments.

- Utilize traffic count data that was collected as part of the TIS and growth rate data provided in previously approved studies to project anticipated traffic growth at the studied intersections.

- Describe the project in detail and what changes to existing intersections need to be made, based on findings herein.

- Estimate projected traffic due to the multiple types of proposed developments within both subdivisions.

- Analyze both the capacity of select intersections, utilizing the Highway Capacity Manual (2016).

- Perform Parking Evaluations, Multimodal Evaluations, a Site Distance Review and a Site Review of the newly proposed R3 and GC zoned developments.

- Provide a recommendation on the nature and type of improvements deemed necessary by the results of this TIS.

2.3 Intersections Studied

The following intersections have been studied extensively in the preparation of this traffic impact study:

- Tracker Road and Main Street (existing)
- Main Street and Mandy Lane (proposed)
- Donald Street and Tracker Road (proposed)
- Maxine Avenue and Tracker Road (proposed)
- Main Street and Greenbriar Drive (proposed but currently a 3 leg intersection)

2.4 Location Map of Project

The following map shows the location of the project, and the studied intersections:

3. DEVELOPMENT SITE

3.1 Existing Land Use

Prior to the generation of this TIS, the land in question was recently rezoned and annexed into the city limits. The land comprising Walker Woods subdivision currently has one residential dwelling on it and the land comprising Walker Estates subdivision currently has no structures on it and is primarily pasture. Traffic count data was acquired at the intersection of Tracker and Main for both the peak AM and PM hours, and traffic data at Greenbriar Drive in terms of project traffic entering/exiting that drive was estimated based on its existing land use. Due to the nature of the multifamily improvements, the residential area in and around Greenbriar Drive, Viola Street and Flora Street have been classified as "Residential Condo/Townhouses" according to the latest edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual. The ITE Land Use Code is 230. Anticipated traffic and turning movements was estimated using this approach due to its current 'one way in, one way out' access onto Main. As appropriate, traffic count data was quantified from the intersection of Tracker and Main accordingly. Traffic directionality was estimated in line with corresponding AM/PM peak hour ratios observed during the traffic counts at Tracker Road and Main Street.

3.2 Proposed Land Use

As mentioned previously in this study, multiple types of proposed land uses will result from these two developments. Within the Walker Estates Subdivision, the following land use codes in the ITE Trip Generation Manual have been assumed: Business Park, Apartments, and Single-Family Homes. The respective ITE Land Use Codes are 770, 220 and 210. Independent variables for the Apartments and the Single-Family Homes are both "Dwelling Units (DU's), while the Business Park independent variable is total floor area in KSF. Between both Walker Estates and Walker Woods subdivisions, the combined "Business Parks" have a total floor area of approximately 37.5 KSF, total of 95 dwelling units from "Apartments" and a total of 79 dwelling units of "Single Family Homes". Using OTO guidance, floor area was chosen as the independent variable in the "Business Parks" land use, as it is more general in nature. Refer to Section 5 of this study for detailed trip generation tables.

Future growth in terms of adjacent traffic along Tracker Road and Main Street will occur, and a rate of 2% is assumed. Full buildout of both subdivisions is expected to occur within 2 years.

3.3 Proposed Access Points

As can be seen previously in this study, as well as in the attached Preliminary Plats for both subdivisions (Exhibits 1 and 2), there are 4 proposed access points; two at Walker Woods

Subdivision and two at Walker Estates Subdivision.

Walker Woods proposed access points consist of new intersections at Mandy Lane and Main Street and Tracker Road and Donald Street. Walker Estates proposed access points consist of a new intersections at Maxine Avenue and Tracker Road and a modified intersection at Greenbriar Drive and Main Street. The modified intersection will transition from a 3-leg intersection to a 4-leg intersection.

3.4 Relationship to Current Plans

Based on discussions with City staff, as well as long range OTO plans, the proposed subdivision and road improvements are in line with the future vision of the City of Nixa. All planned drives, both commercial and residential will comply design standards.

3.5 Multimodal Evaluation

The subdivision will be designed in accordance with City standards, as well as ADA regulations. Accessibility will be provided for transit services. Bicycle lanes are currently in place in select locations running parallel with Main Street. Bicycle lanes will be incorporated into the design of the intersection of Mandy Lane and Main Street, to continue the recently constructed bicycle lane to the north. Sidewalks will be provided in both subdivisions and will meet ADA guidelines for safe pedestrian movements.

3.6 Study Scenarios

The forecasts for this Level II TIS will include three “No-Build” scenarios and two “Build” scenarios. The “No Build” scenarios will consist of traffic forecast for Existing Conditions, the year of full build out, and 20 years after full build out. The “Build” scenarios will consist of traffic forecast for the year of full build out, and 20 years after the full build out. 2021 is the existing year, 2023 is the proposed year of full build out, and 2043 is 20 years after full build out.

Forecasts for future year scenarios will be based on an accepted growth rate of surrounding traffic of 2%. Adding traffic from the proposed developments to the related “No-Build” scenarios provides the expected traffic for the full build out scenario forecasts.

4. EXISTING CONDITIONS

4.1 Description of Key Roads

The following streets surround the area of expansion:

- Main Street
  - Functional Classification: Collector
  - 35 MPH posted speed limit south of Tracker Road and 40 MPH posted speed limit north of Tracker Road

- Tracker Road
  - Functional Classification: Secondary Arterial
  - 30 MPH posted speed limit

- Greenbriar Drive
  - Functional Classification: Local Road
  - No speed limit posted; City-wide base speed limit of 30 MPH applies

Refer to Exhibit 6, which depicts the OTO's road classifications throughout the area, in their Major Thoroughfare Plan.

4.2 Intersection Traffic Volumes and Turning Counts

As mentioned in the Introduction of this study, raw traffic count data was collected at the intersection of Tracker Road and Main Street in June of 2021. Additionally, ITE trip generation estimates were performed to estimate traffic at Greenbriar Drive, as it is a one way in one way out intersection into the existing multifamily development. Supporting documentation can be found in Appendix B of this study. The following 4 exhibits depict AM and PM peak hour turning movement diagrams (TMD) at both studied intersections as they existed in June of 2021.

Exhibit 4.2.1 Tracker Rd. & Main St. TMD - AM Peak Hour for Existing Scenario (2021)

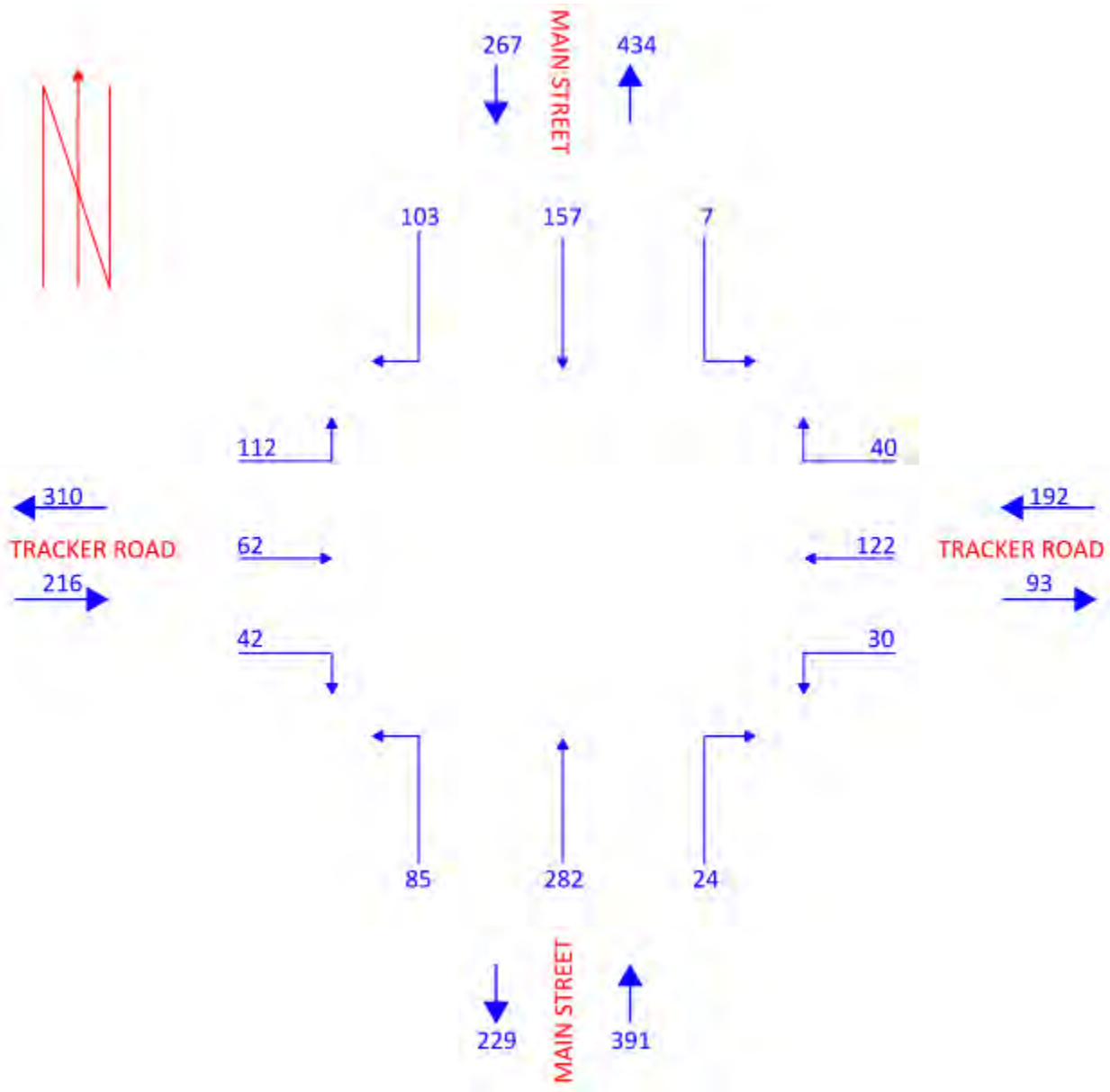


Exhibit 4.2.2 Tracker Rd. & Main St. TMD - PM Peak Hour for Existing Scenario (2021)

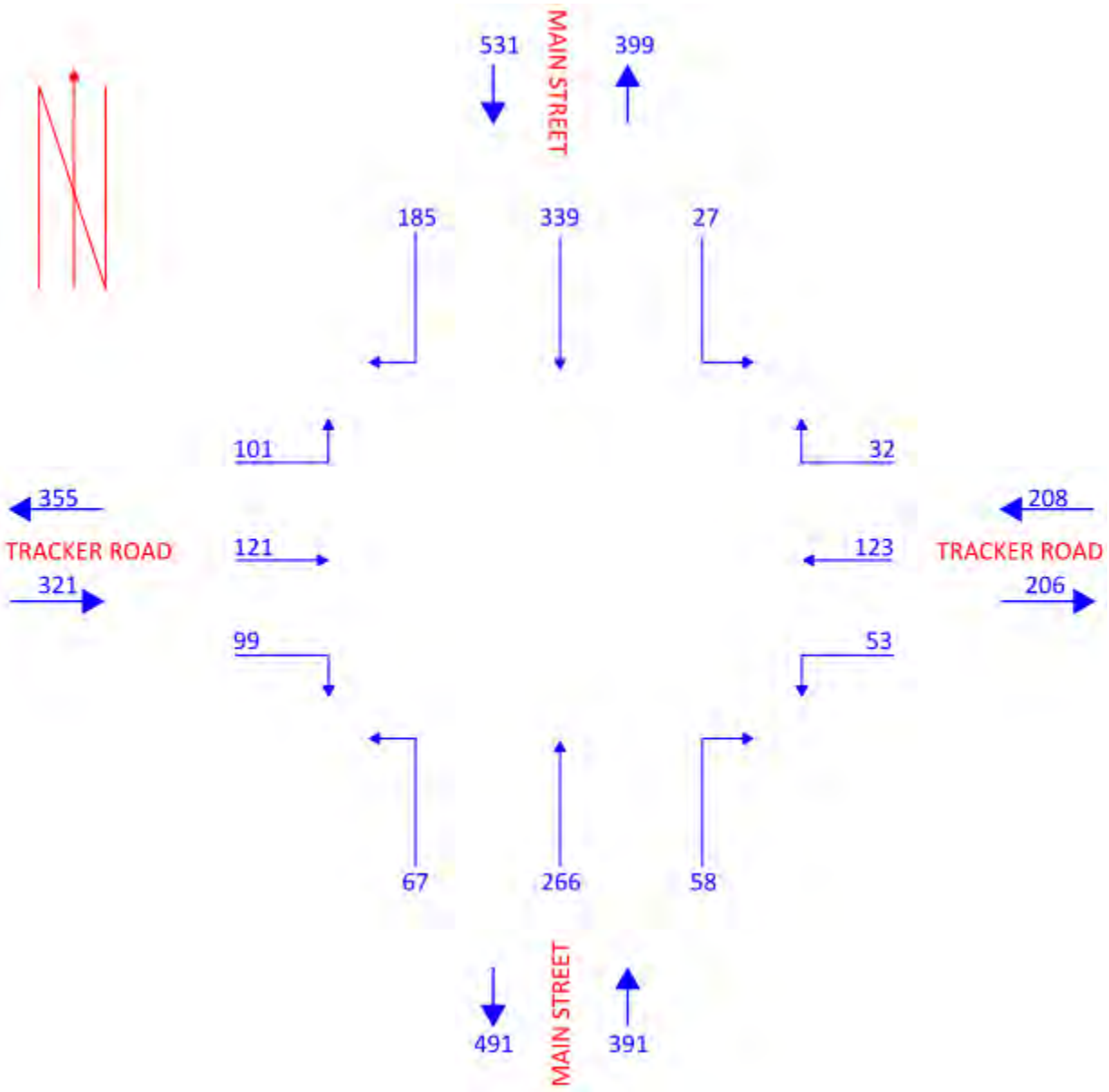


Exhibit 4.2.3 Greenbriar Dr. & Main St. TMD - AM Peak Hour for Existing Scenario (2021)

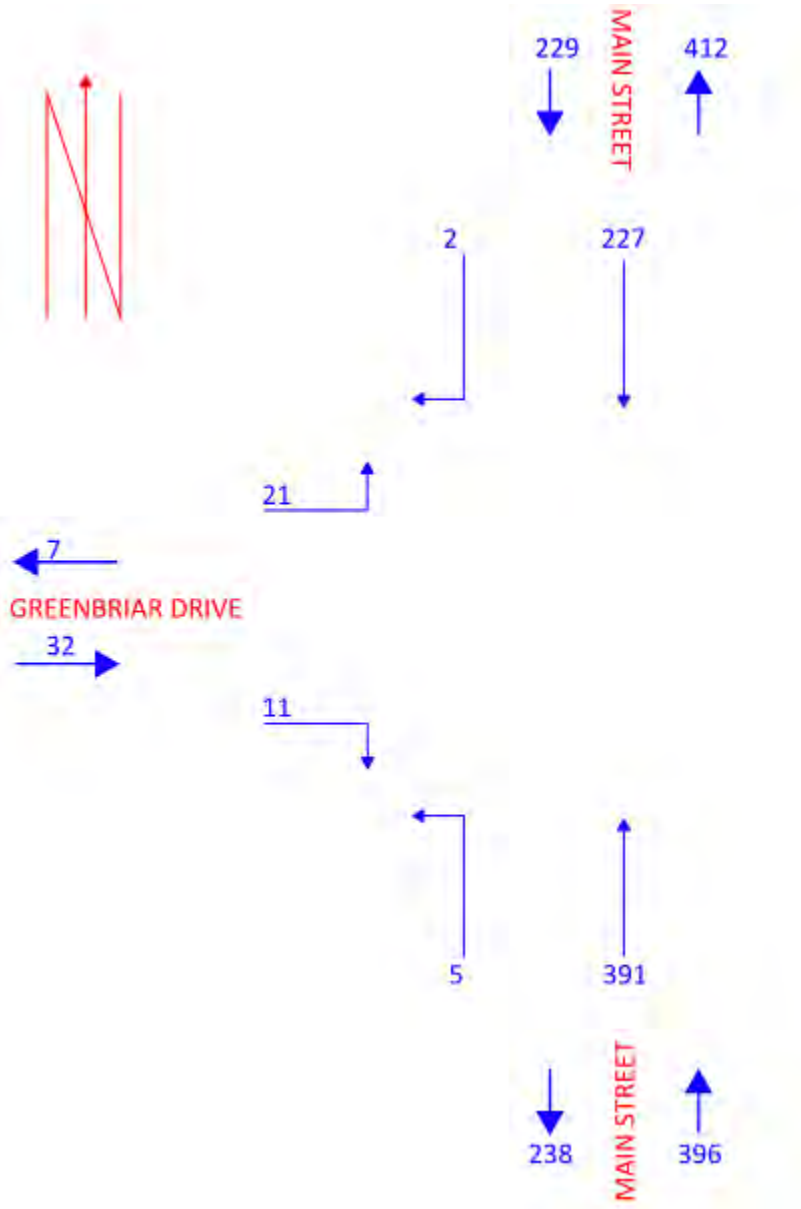
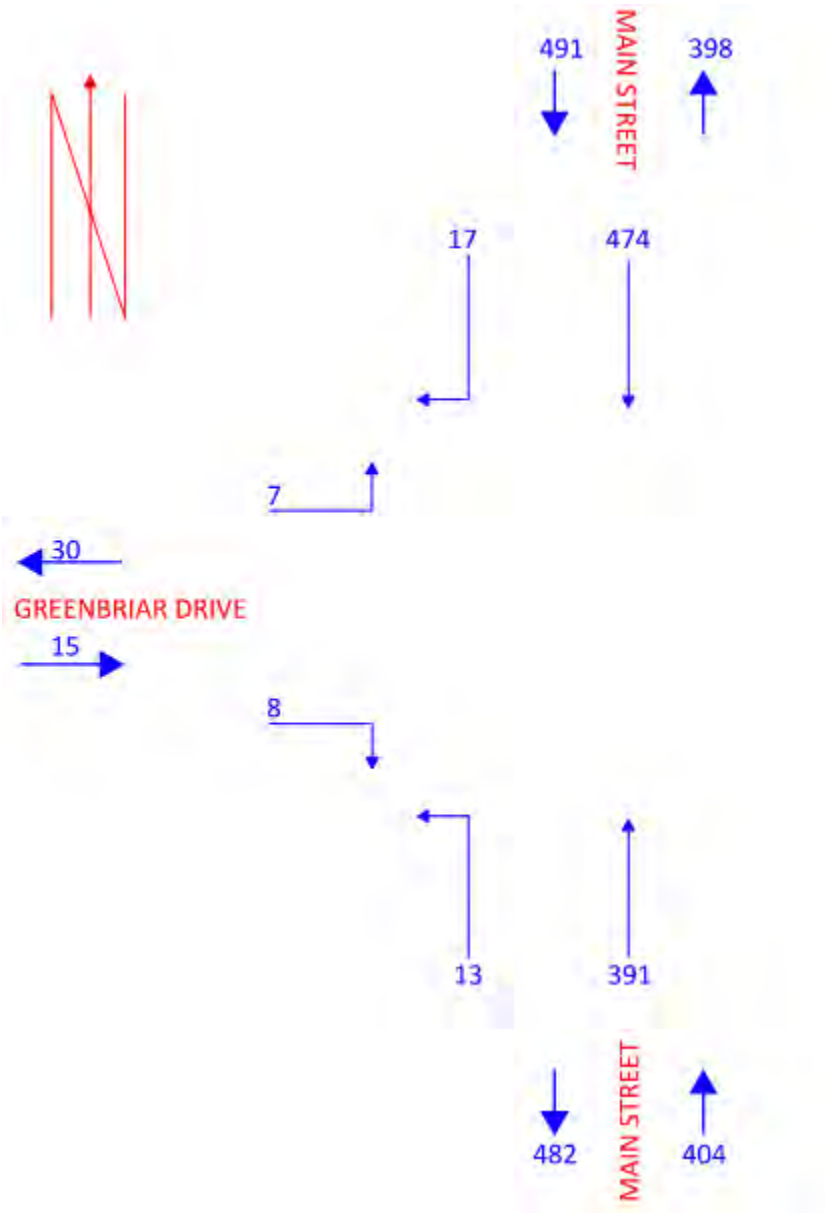


Exhibit 4.2.4 Greenbriar Dr. & Main St. TMD - PM Peak Hour for Existing Scenario (2021)



Based on the field collected traffic count data, the Tracker Road and Main Street AM Peak Hour occurs from 7 AM to 8 AM, while the PM Peak Hour is from 4:30 PM to 5:30 PM. This also holds true and can be applied to the intersection at Greenbriar Drive and Main Street.

4.3 Available Bike and Pedestrian Infrastructure

As mentioned previously in this study, bicycle lanes were recently added to the intersection of Tracker Road and Main Street when it was improved. All legs of the intersection, except for east on Tracker, contain dedicated bicycle lanes. The new local roads within the subdivision will be designed in accordance with the City of Nixa standards and will accommodate anticipated bicycle and pedestrian traffic safely.

4.4 Available Transit Infrastructure

As mentioned previously in this study, the proposed infrastructure will be designed in accordance with the City of Nixa standards and will accommodate transit, such as OAT's.

5. PROJECTED TRAFFIC

5.1 Estimated Trip Generation and/or Relocated Traffic

Utilizing the latest edition of the ITE Trip Generation Manual, see the following tables:

Table 5.1.1: Trip Generation for existing Greenbriar Drive Development

ITE LAND USE CODE	DESCRIPTION OF ITE CODE	UNITS	EXPECTED UNITS	TOTAL GENERATED TRIPS			DISTRIBUTION OF GENERATED TRIPS			
			Ind. Variable	Daily	AM HOUR	PM HOUR	AM In	AM Out	PM In	PM Out
230	Resd. Condo/Townhouse	DU [1]	87	505	38	45	7	32	30	15
DU [1] = Dwelling Units										

Table 5.1.2: Trip Generation for Walker Estates Proposed Subdivision

ITE LAND USE CODE	DESCRIPTION OF ITE CODE	UNITS	EXPECTED UNITS	TOTAL GENERATED TRIPS			DISTRIBUTION OF GENERATED TRIPS			
			Ind. Variable	Daily	AM HOUR	PM HOUR	AM In	AM Out	PM In	PM Out
770	Business Park	KSF [1]	17.5	218	25	22	21	4	6	16
220	Apartments	DU [2]	95	632	48	59	10	39	38	21
210	Single Family Homes	DU [2]	25	238	19	25	5	14	16	9
			Totals	1088	92	106	36	57	60	46
KSF [1] = Units of 1,000 square feet; DU [2] = Dwelling Units										

Table 5.1.3: Trip Generation for Walker Woods Proposed Subdivision

ITE LAND USE CODE	DESCRIPTION OF ITE CODE	UNITS	EXPECTED UNITS	TOTAL GENERATED TRIPS			DISTRIBUTION OF GENERATED TRIPS			
			Ind. Variable	Daily	AM HOUR	PM HOUR	AM In	AM Out	PM In	PM Out
770	Business Park	KSF [1]	20	249	28	25	24	4	7	19
210	Single Family Homes	DU [2]	54	514	41	54	10	30	34	20
			Totals	763	69	79	34	34	41	39
KSF [1] = Units of 1,000 square feet; DU [2] = Dwelling Units										

5.2 Trip Distribution and Assignment

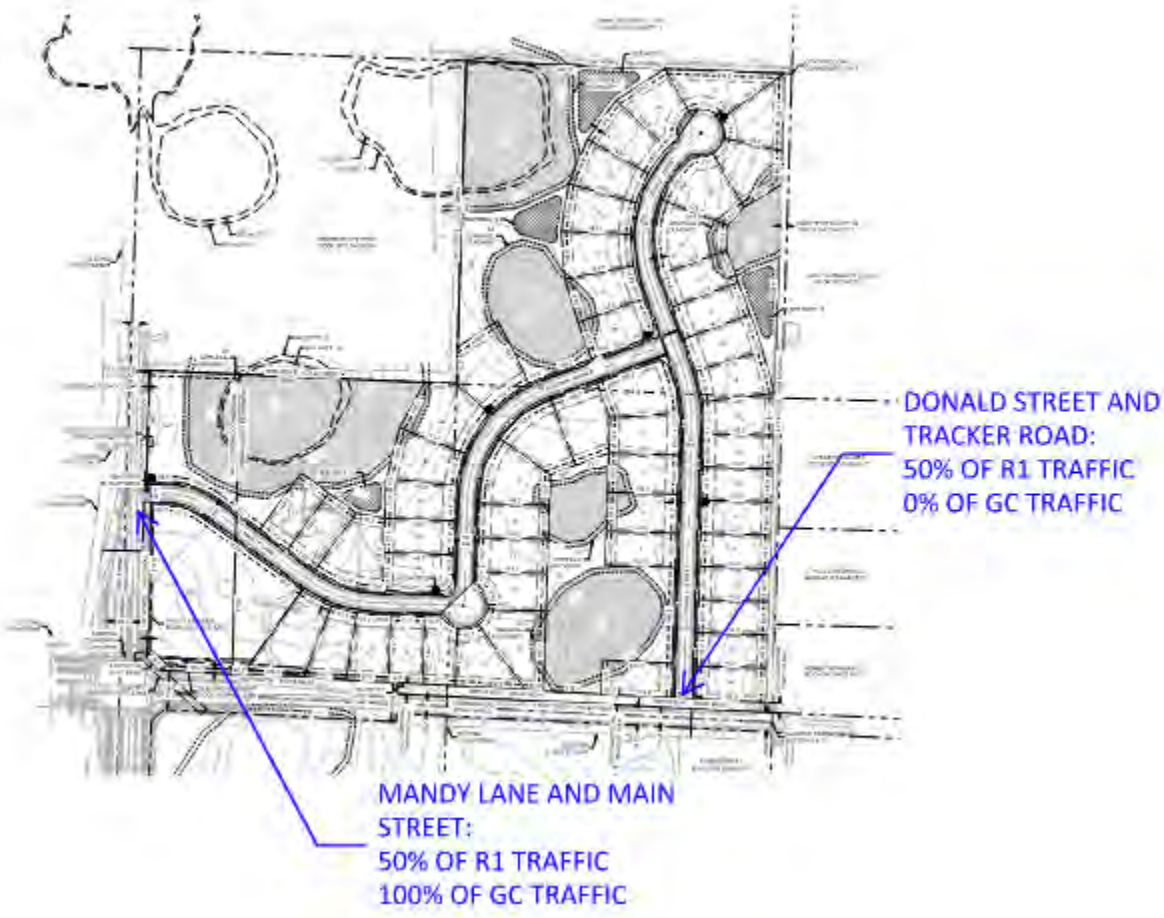
Based on the tables in Section 5.1 above, for the Greenbriar Drive development, the total combined AM Peak Hour of 39 trips (rounded) was comprised of 7 entering trips and 32 exiting trips. Similarly, the PM Peak Hour of 45 was comprised of 30 entering trips and 15 exiting trips.

Based on the tables in Section 5.1 above, for the Walker Estates Subdivision, the total combined AM Peak Hour of 93 trips (rounded) was comprised of 36 entering trips and 57 exiting trips. Similarly, the PM Peak Hour of 106 was comprised of 60 entering trips and 46 exiting trips.

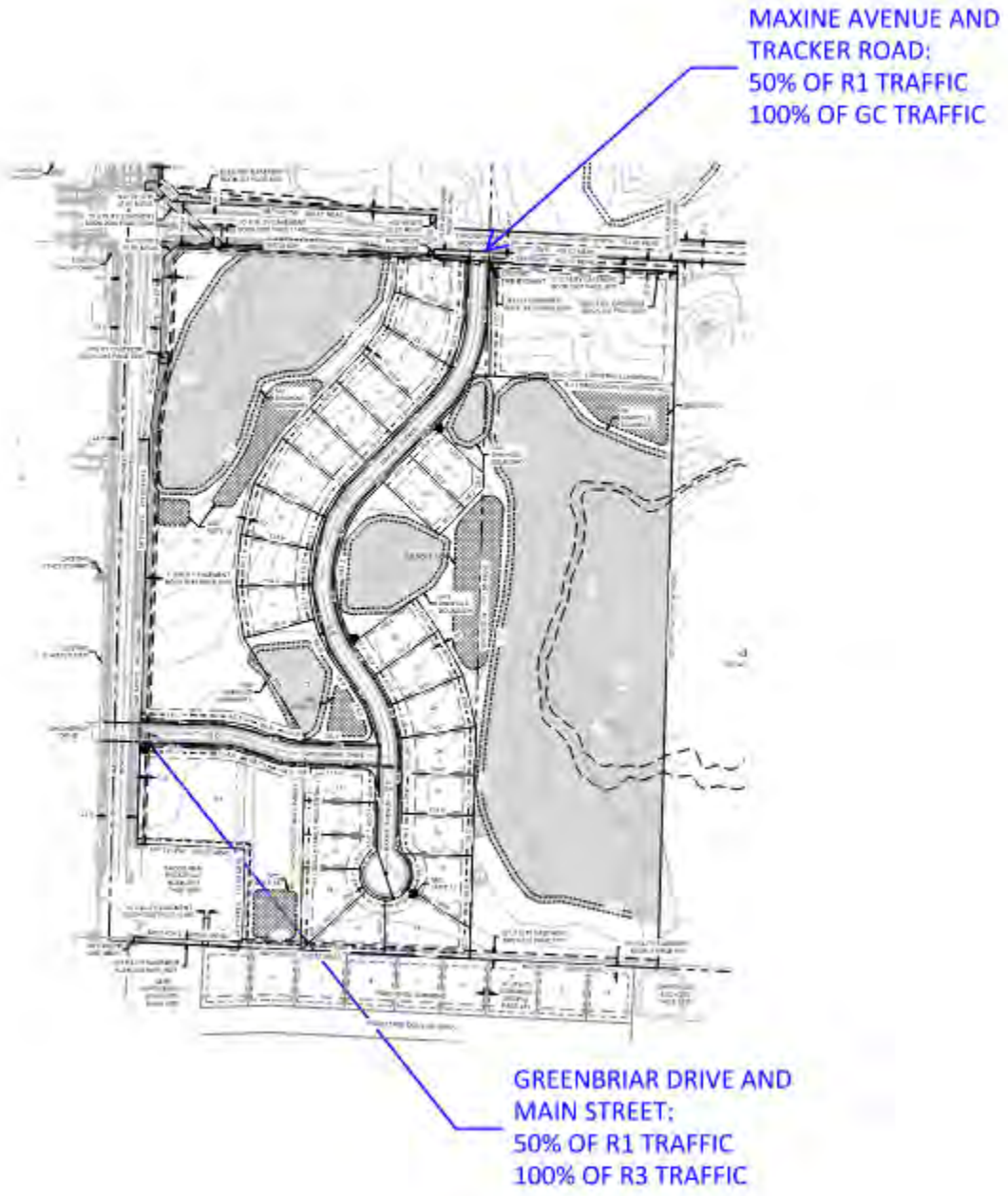
Based on the tables in Section 5.1 above, for the Walker Woods Subdivision, the total combined AM Peak Hour of 68 trips (rounded) was comprised of 34 entering trips and 34 exiting trips. Similarly, the PM Peak Hour of 80 (rounded) was comprised of 41 entering trips and 39 exiting trips.

5.3 Map of Projected Directional Distribution

The following map shows the directional distribution of anticipated traffic flow at the proposed Walker Woods Subdivision located at the northeast corner of Tracker Road and Main Street:



The following map shows the directional distribution of anticipated traffic flow at the proposed Walker Estates Subdivision located at the southeast corner of Tracker Road and Main Street:



5.4 Total Future Traffic (AM/PM)

Utilizing a growth rate of 2% annually, surrounding traffic growth was calculated and applied to the Year of Full Buildout (2023) condition, and the 20 Years after Full Build Out (2043) condition. The following four exhibits depict the "No-Build Scenarios for the 2023 Year of full buildout condition.

Exhibit 5.4.1 Tracker Rd. & Main St. TMD - AM Peak Hour for No-Build Scenario (2023)

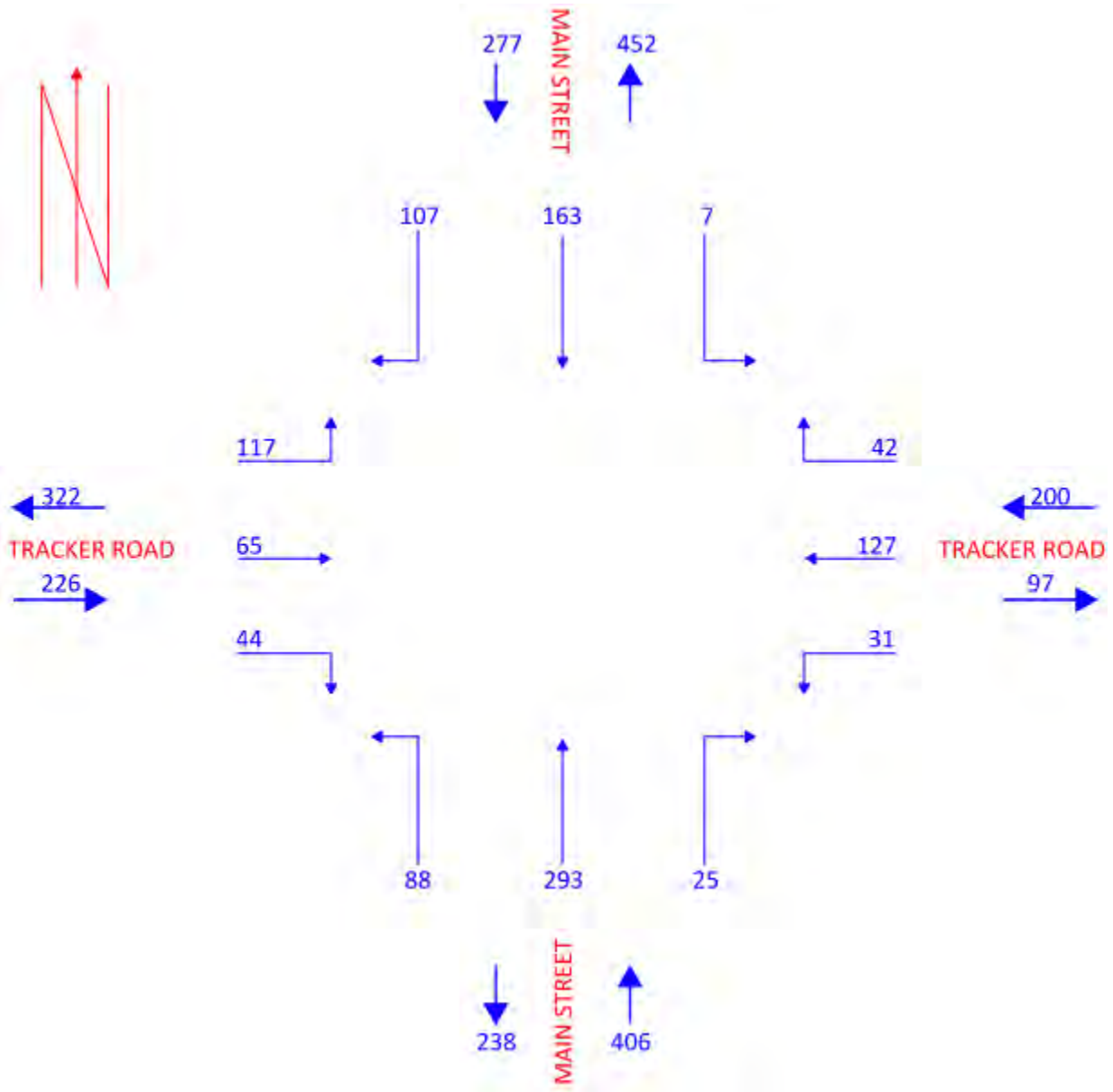


Exhibit 5.4.2 Tracker Rd. & Main St. TMD - PM Peak Hour for No-Build Scenario (2023)

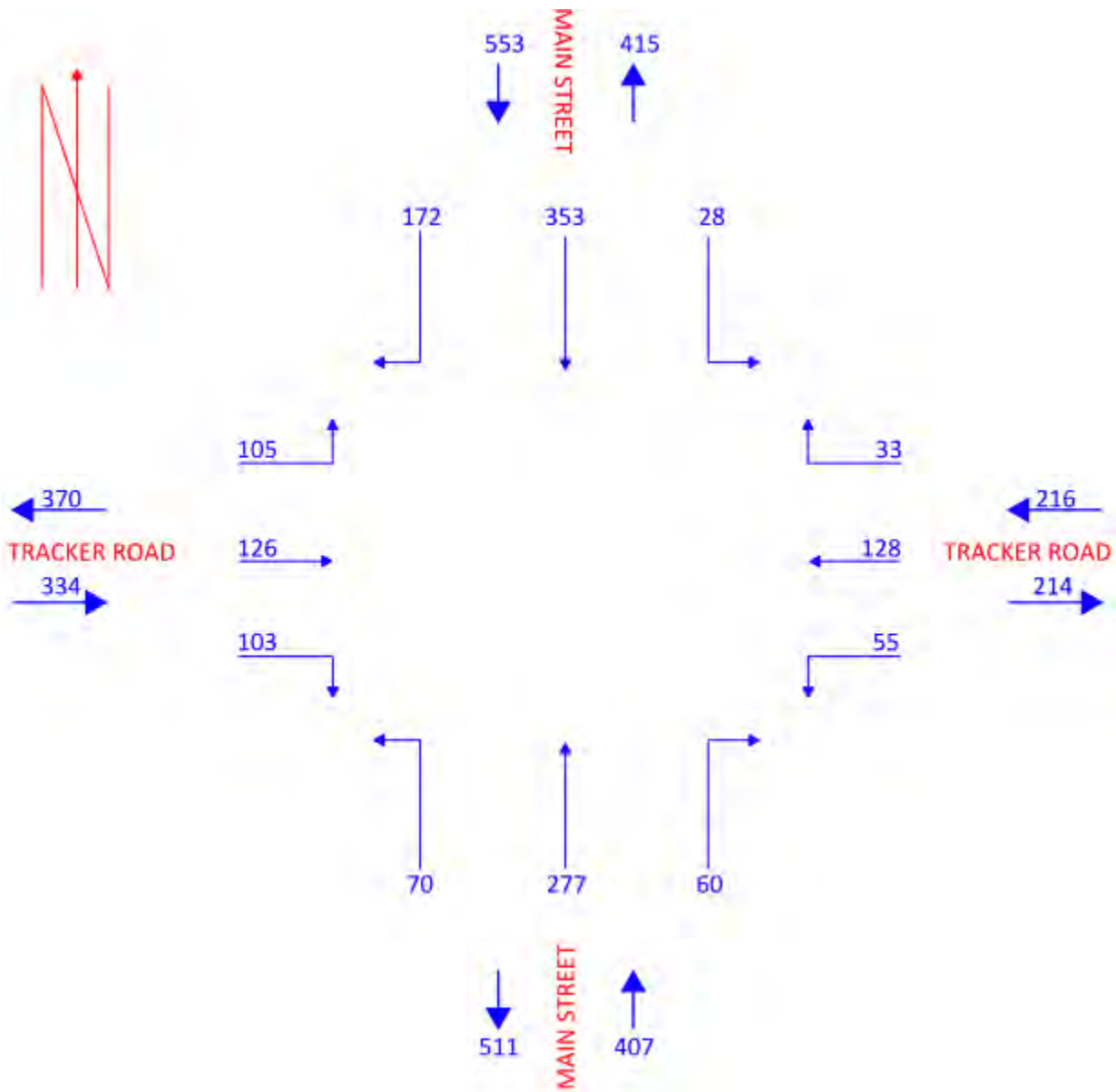


Exhibit 5.4.3 Greenbriar Drive. & Main St. TMD - AM Peak Hour for No-Build Scenario (2023)

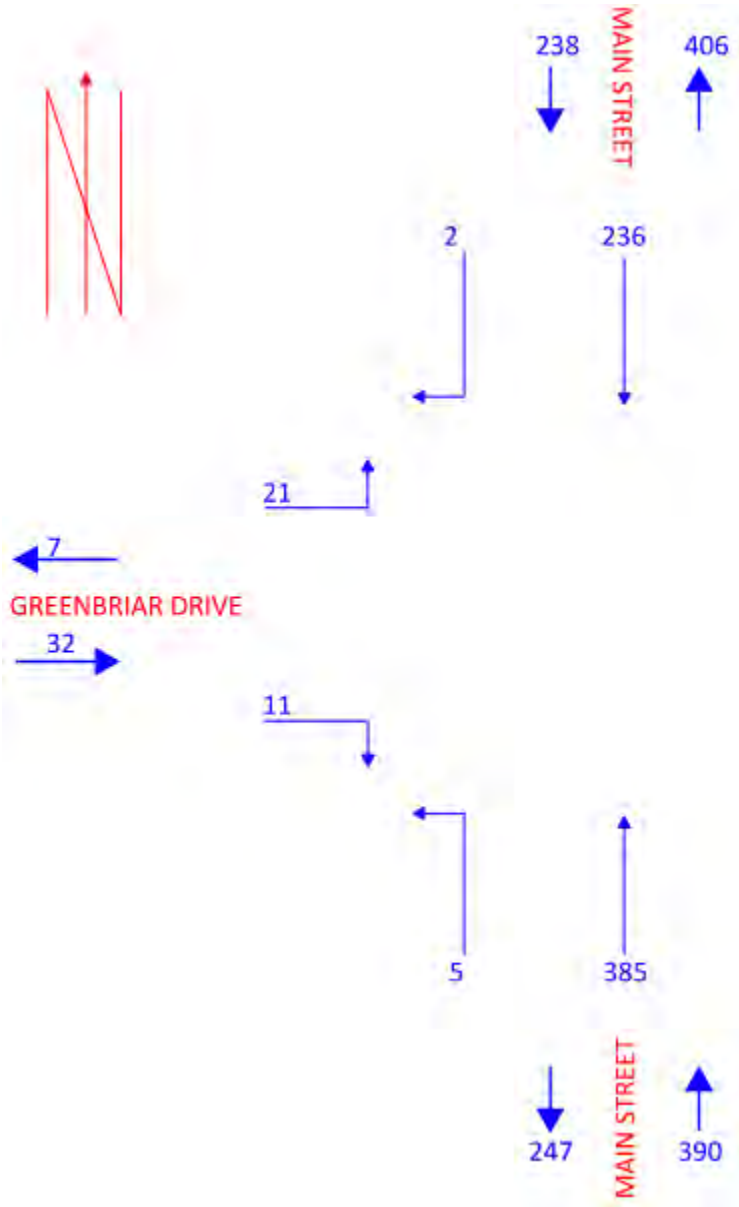
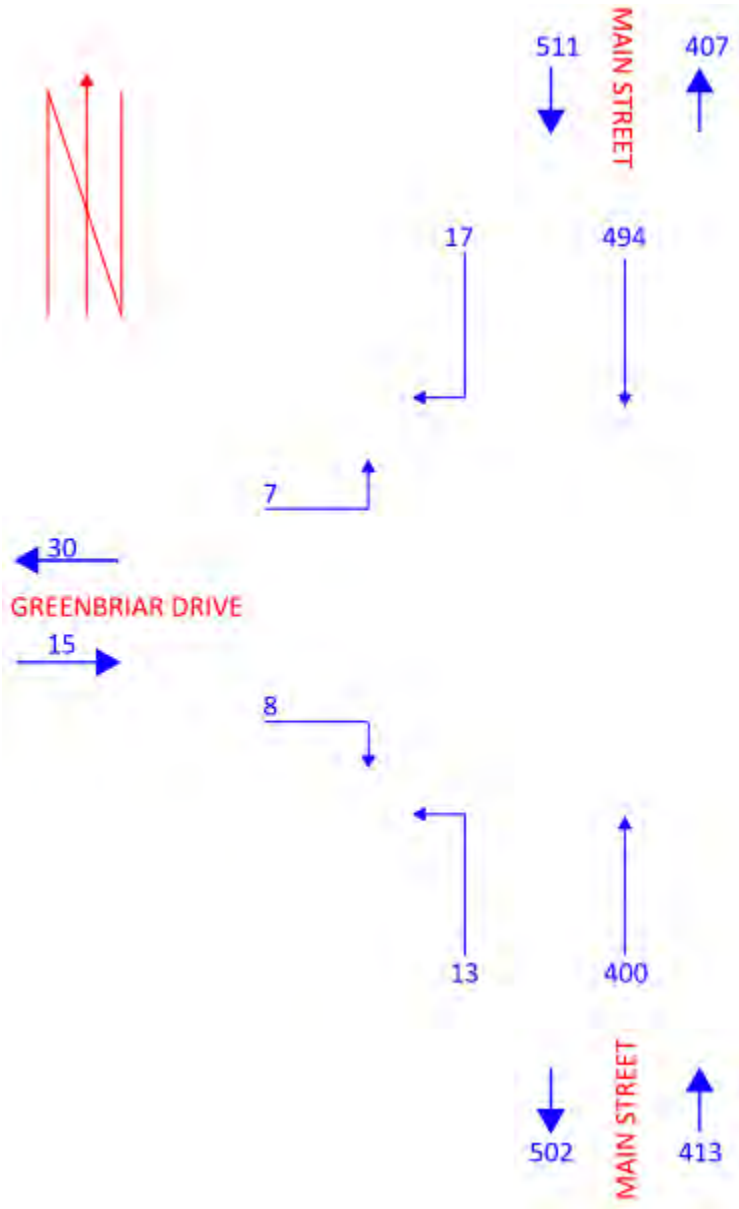


Exhibit 5.4.4 Greenbriar Drive. & Main St. TMD - PM Peak Hour for No-Build Scenario (2023)



The following four exhibits depict the "No-Build Scenarios for the 2043 20 years after Full Buildout Conditions.

Exhibit 5.4.5 Tracker Rd. & Main St. TMD - AM Peak Hour for No-Build Scenario (2043)

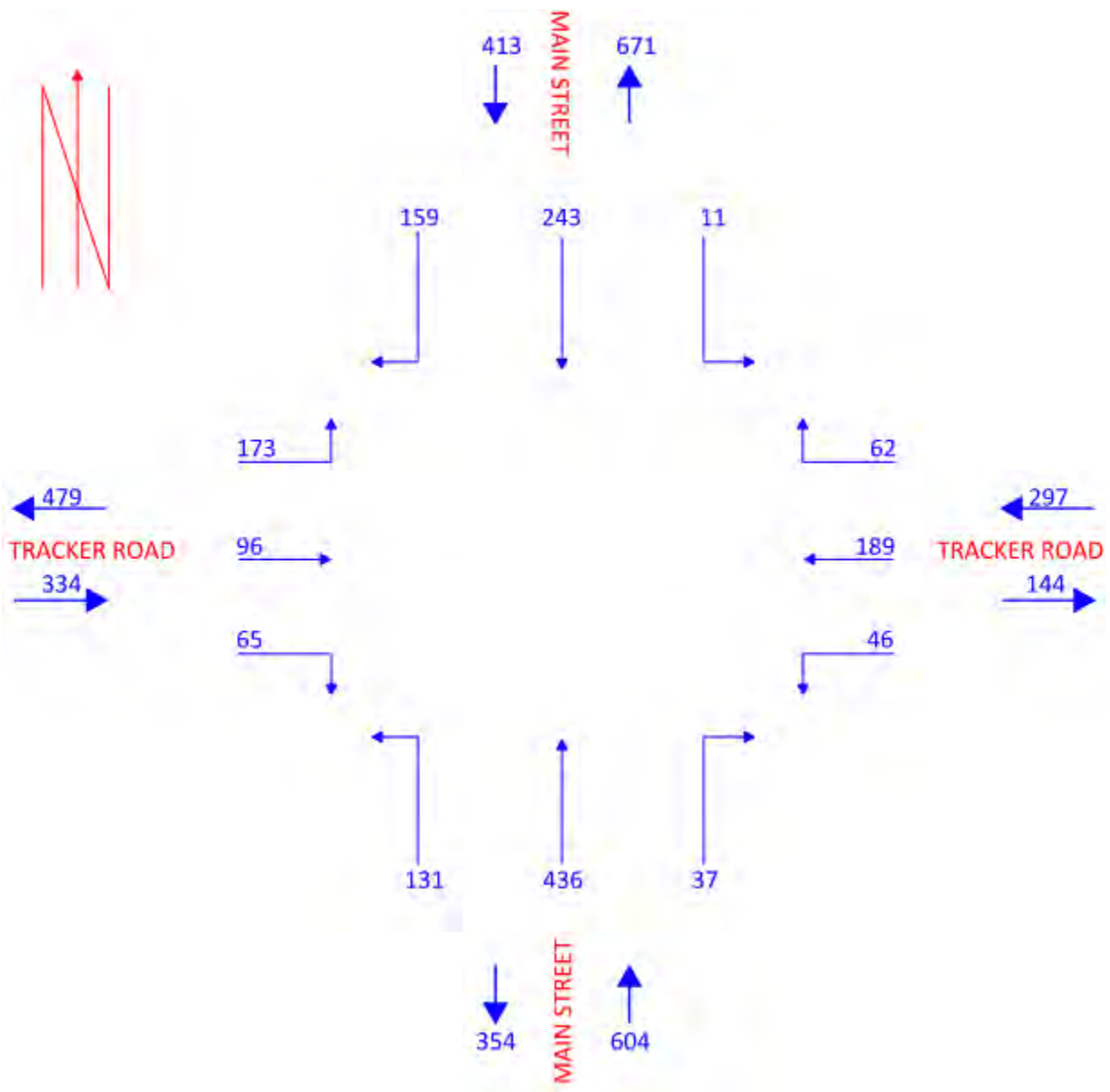


Exhibit 5.4.6 Tracker Rd. & Main St. TMD - PM Peak Hour for No-Build Scenario (2043)

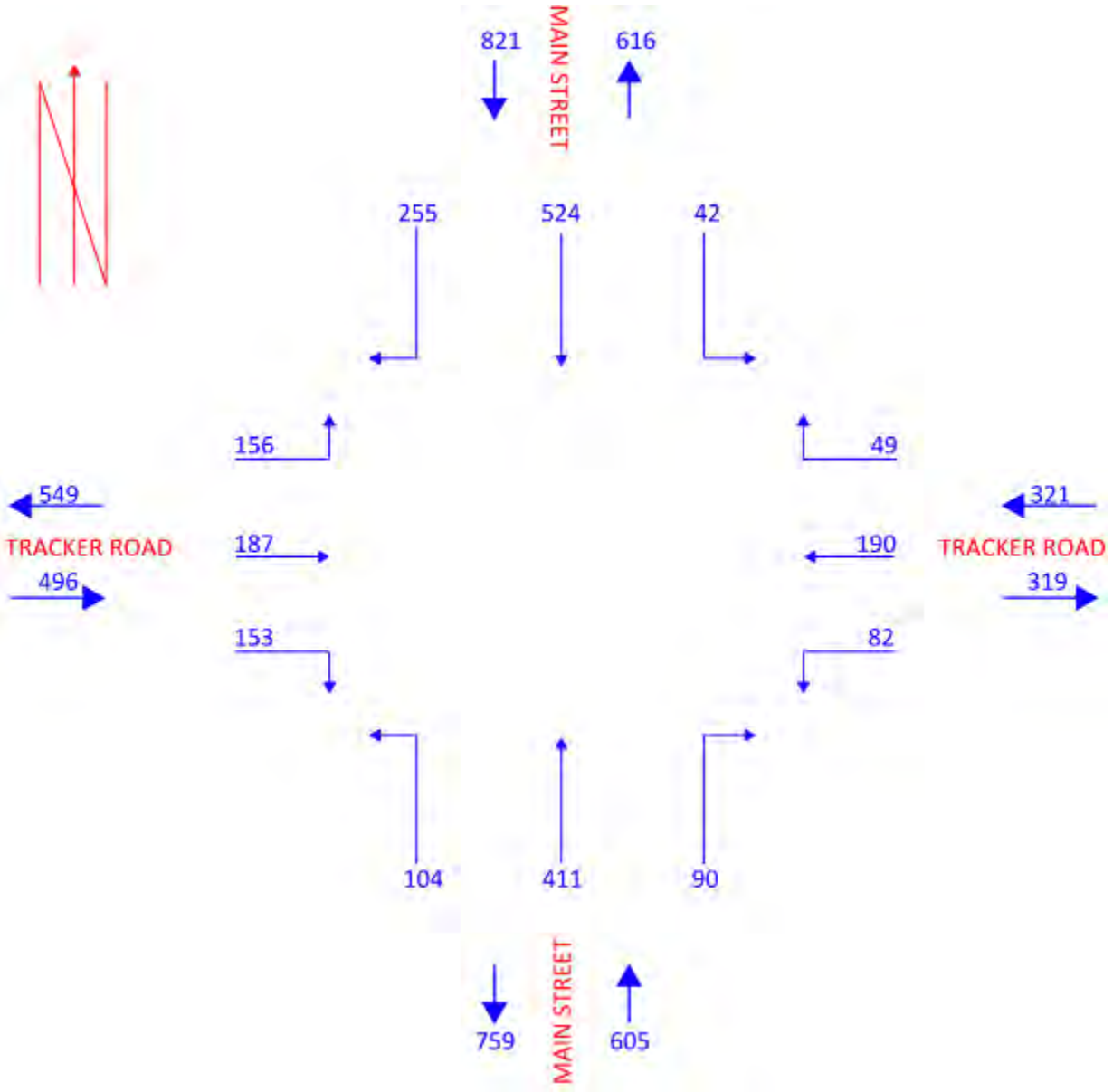


Exhibit 5.4.7 Greenbriar Drive. & Main St. TMD - AM Peak Hour for No-Build Scenario (2043)

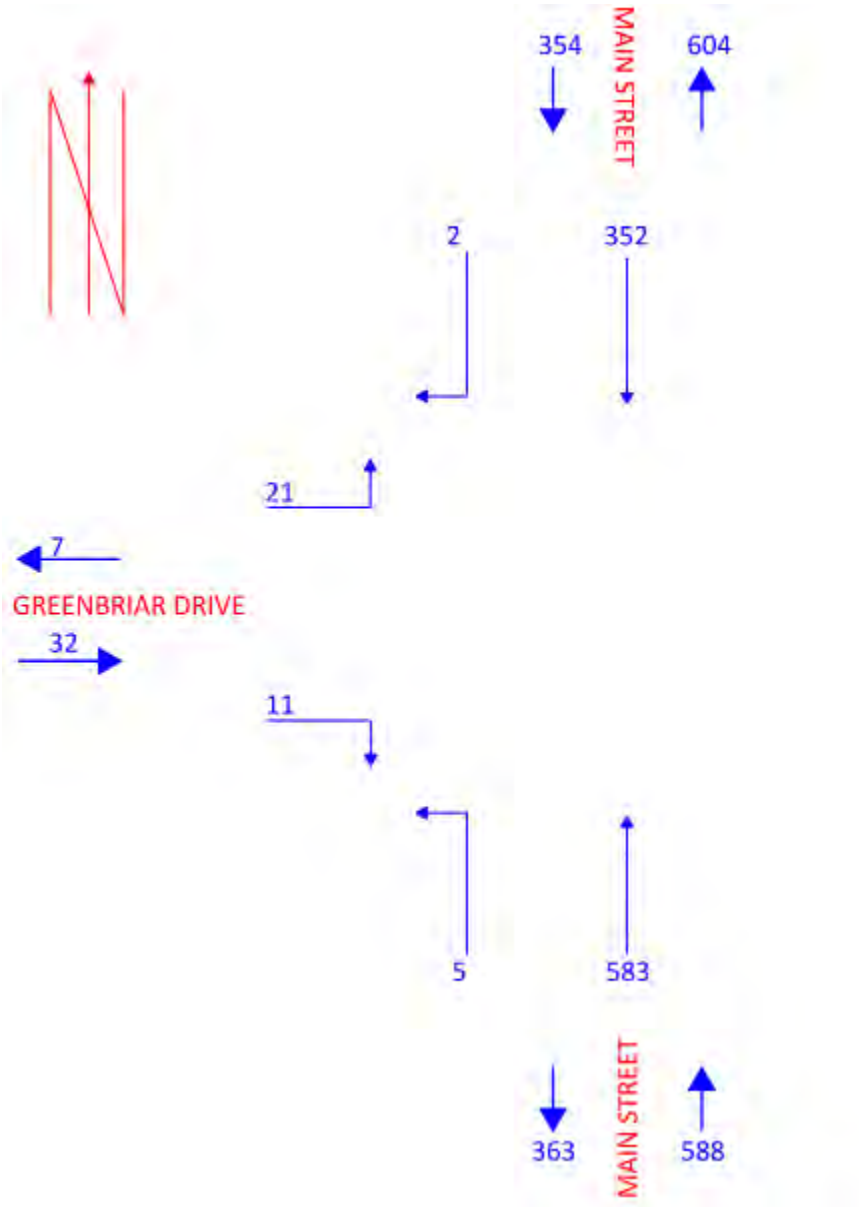
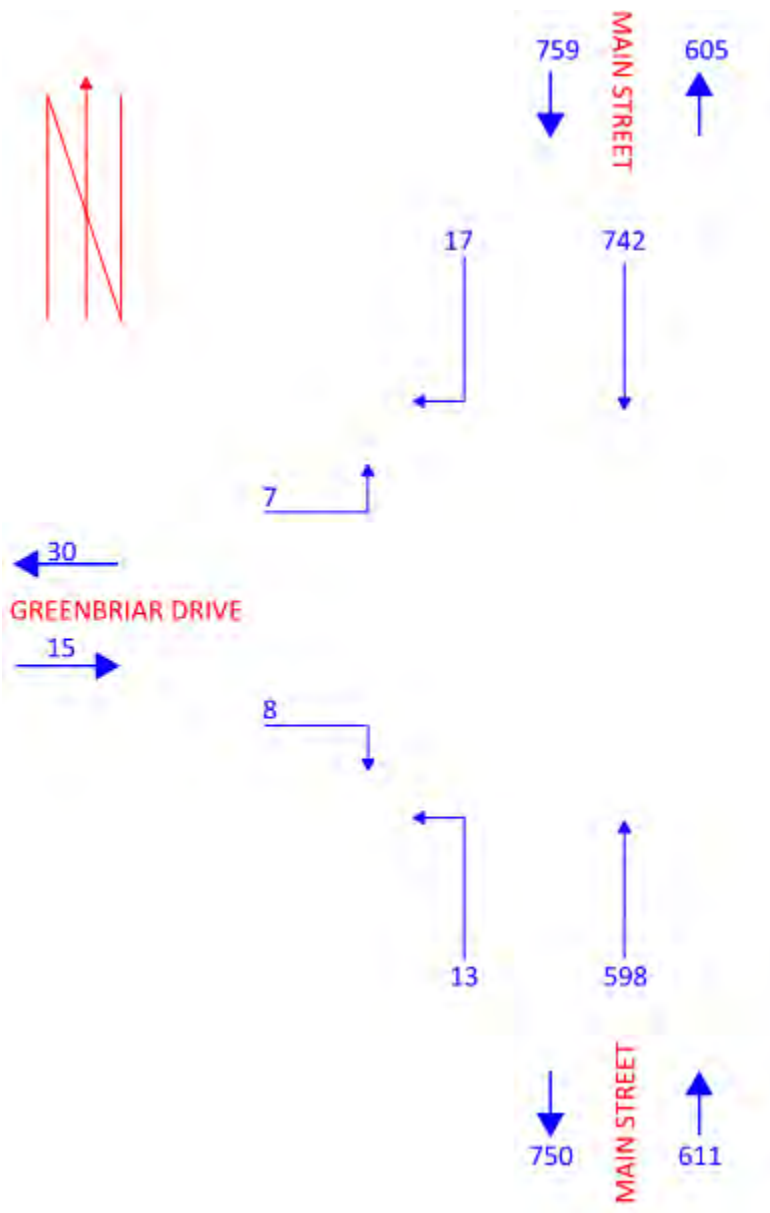


Exhibit 5.4.8 Greenbriar Drive. & Main St. TMD - PM Peak Hour for No-Build Scenario (2043)



The following ten exhibits depict the "Build Scenarios for the 2023 Year of Full Buildout Conditions.

Exhibit 5.4.9 Tracker Rd. & Main St. TMD - AM Peak Hour for Build Scenario (2023)

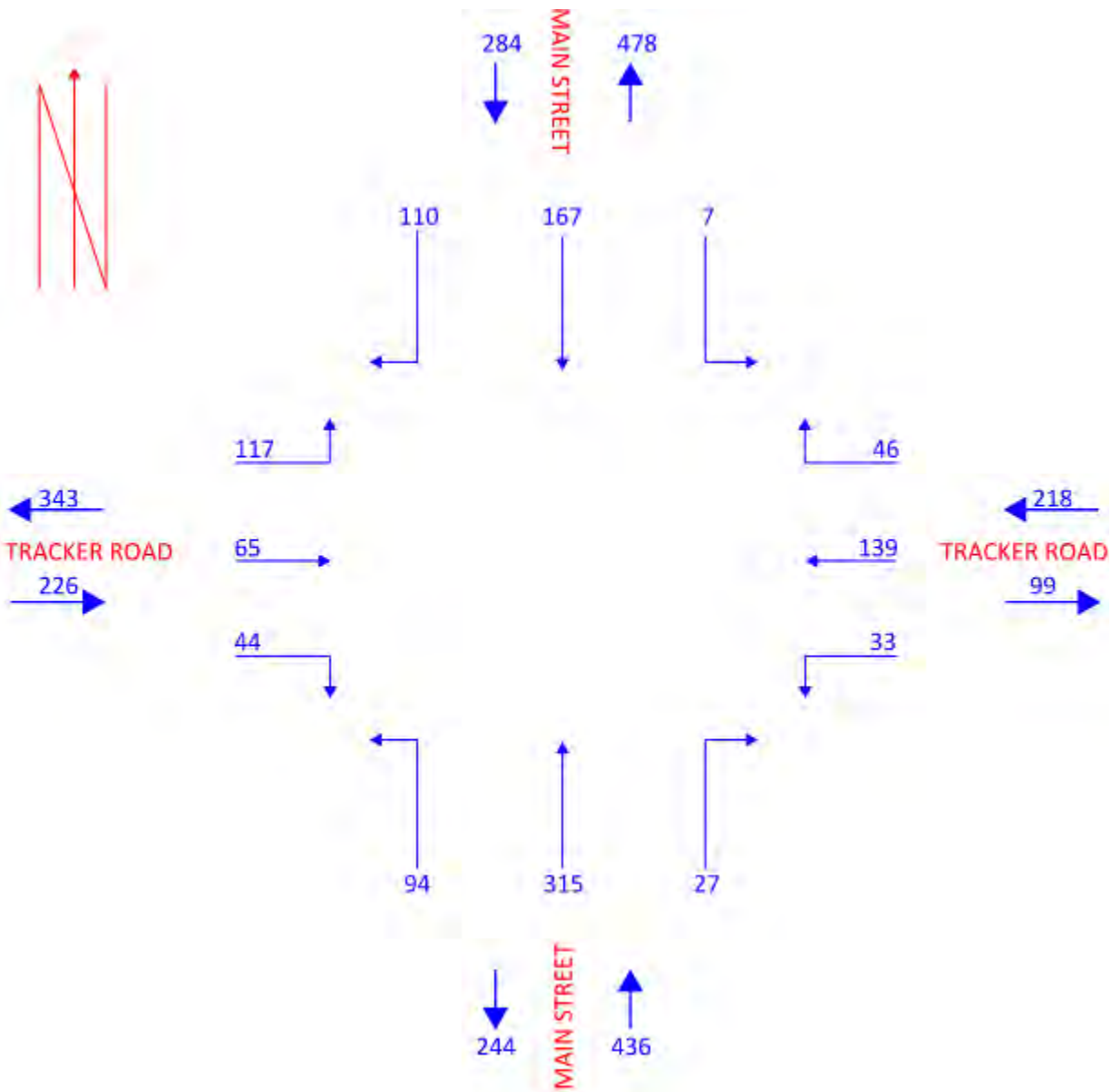


Exhibit 5.4.10 Tracker Rd. & Main St. TMD - PM Peak Hour for Build Scenario (2023)

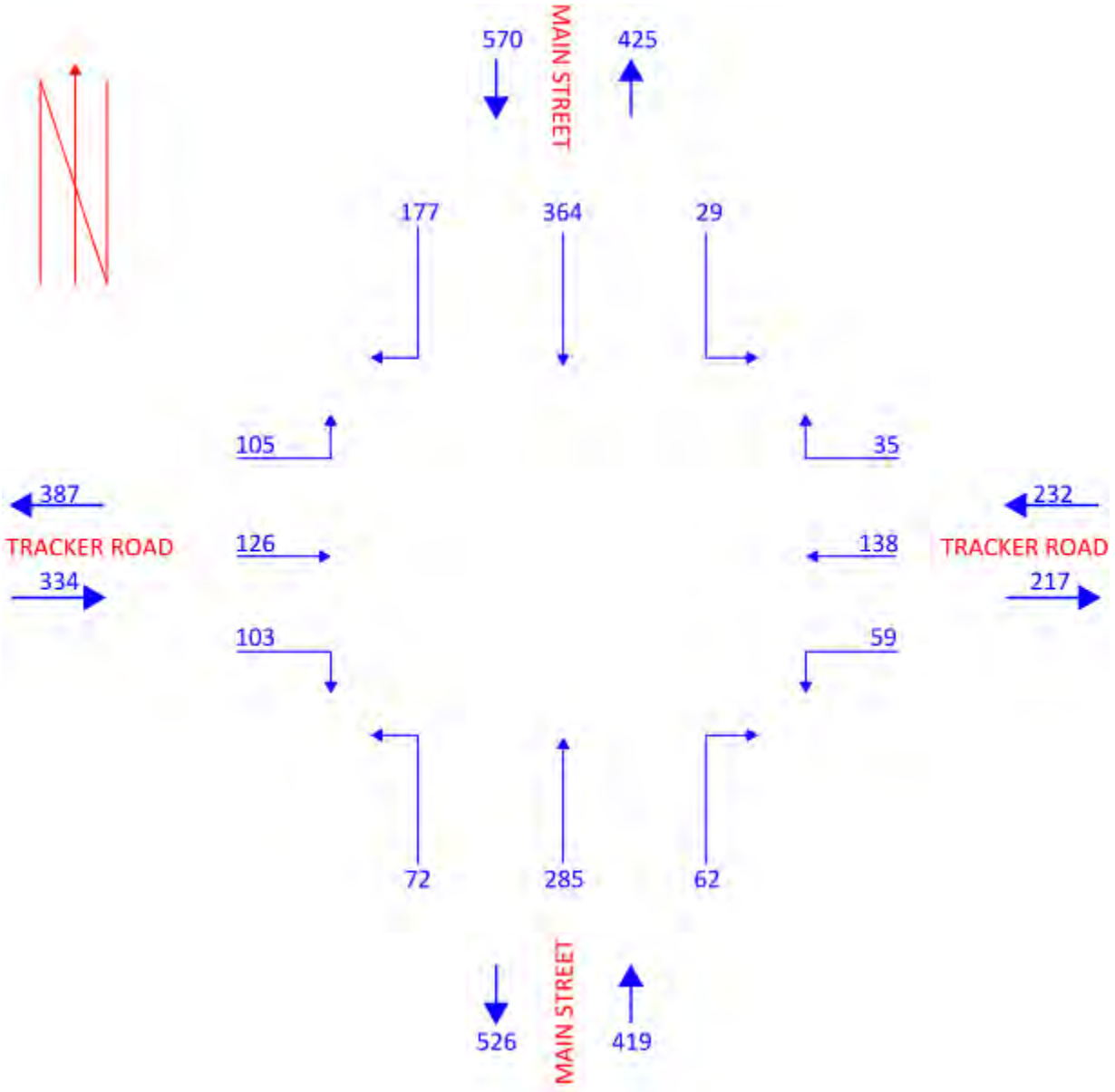


Exhibit 5.4.11 Greenbriar Drive. & Main St. TMD - AM Peak Hour for Build Scenario (2023)

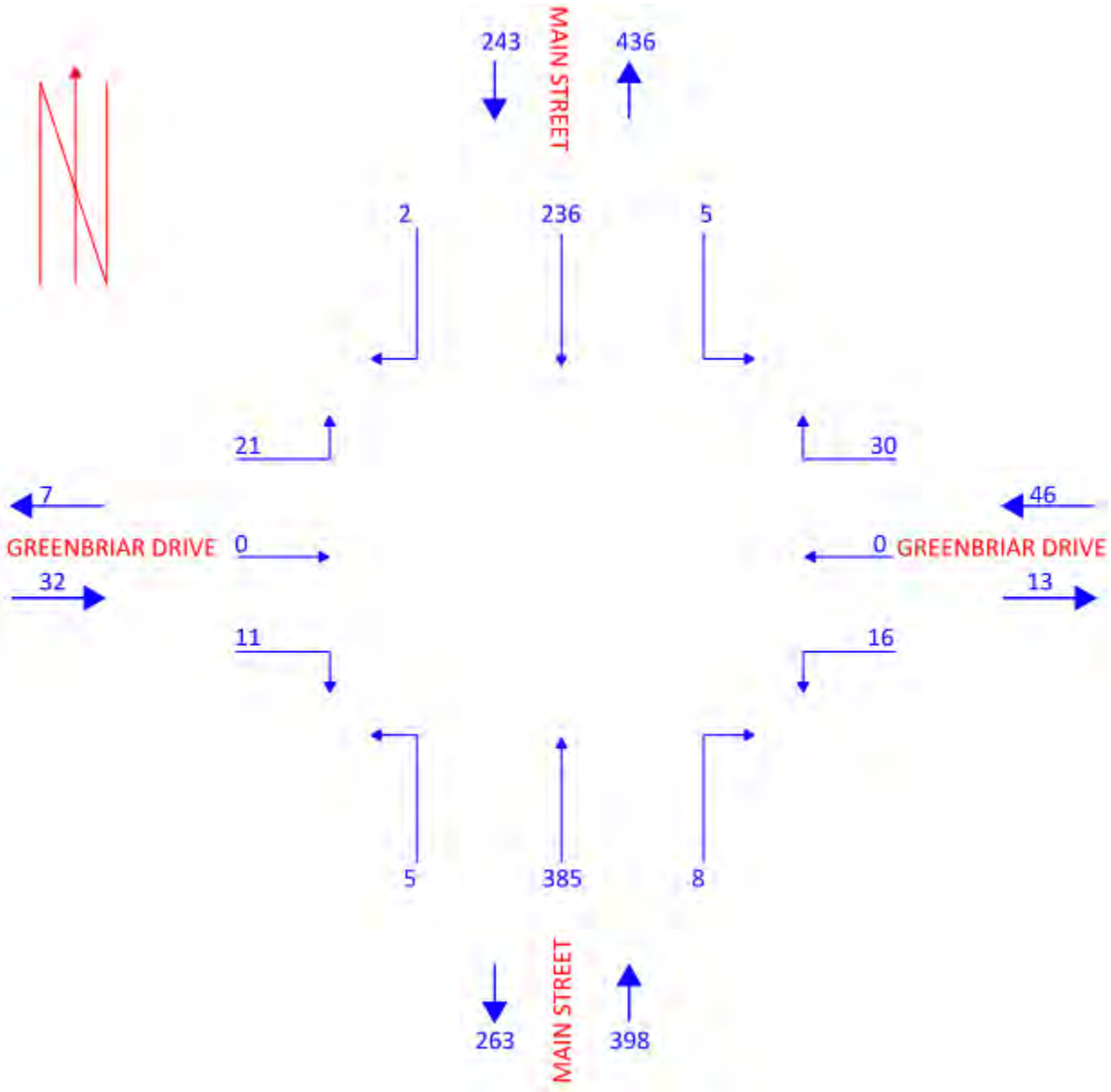


Exhibit 5.4.12 Greenbriar Drive. & Main St. TMD - PM Peak Hour for Build Scenario (2023)

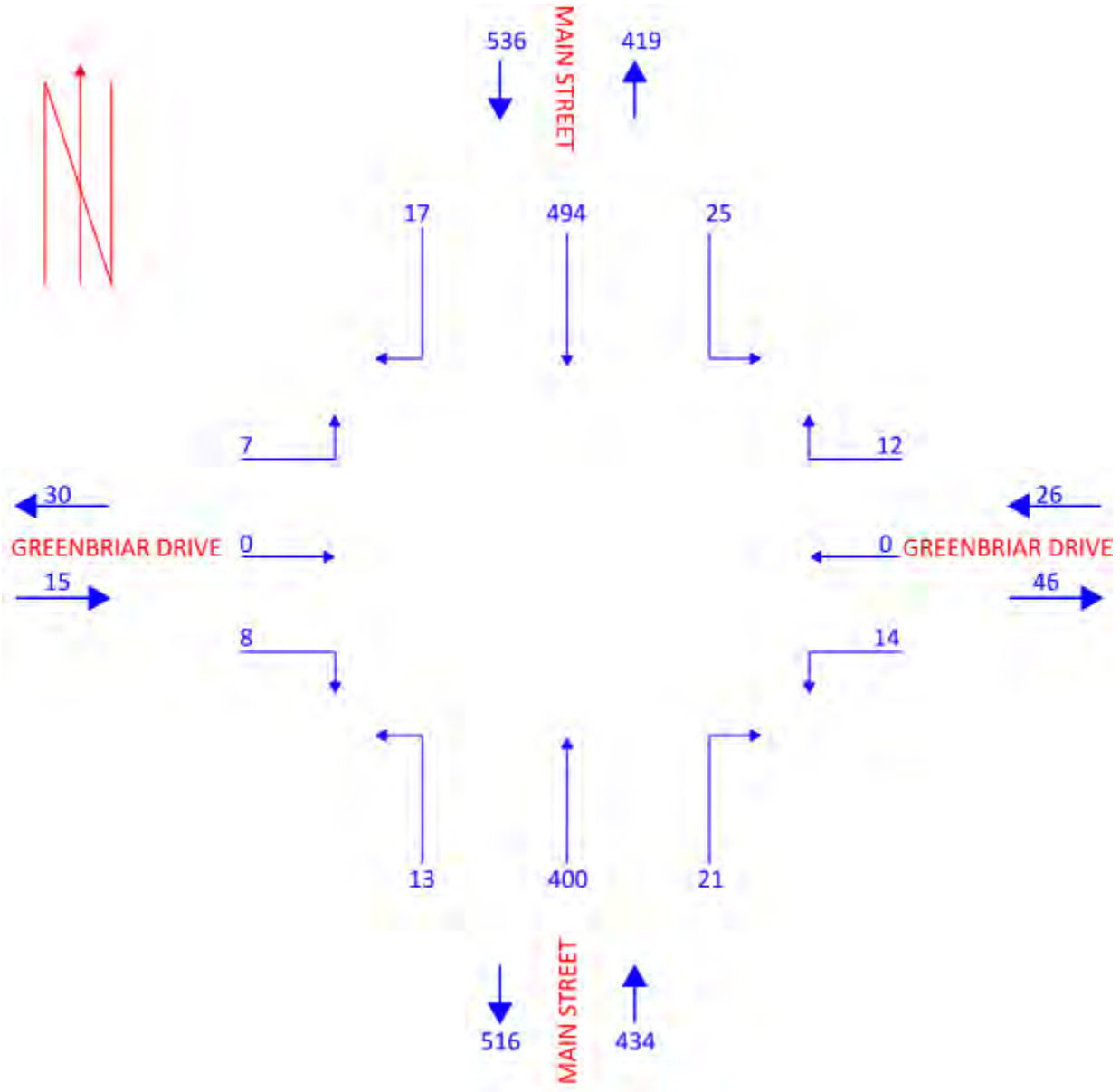


Exhibit 5.4.13 Mandy Lane & Main St. TMD - AM Peak Hour for Build Scenario (2023)

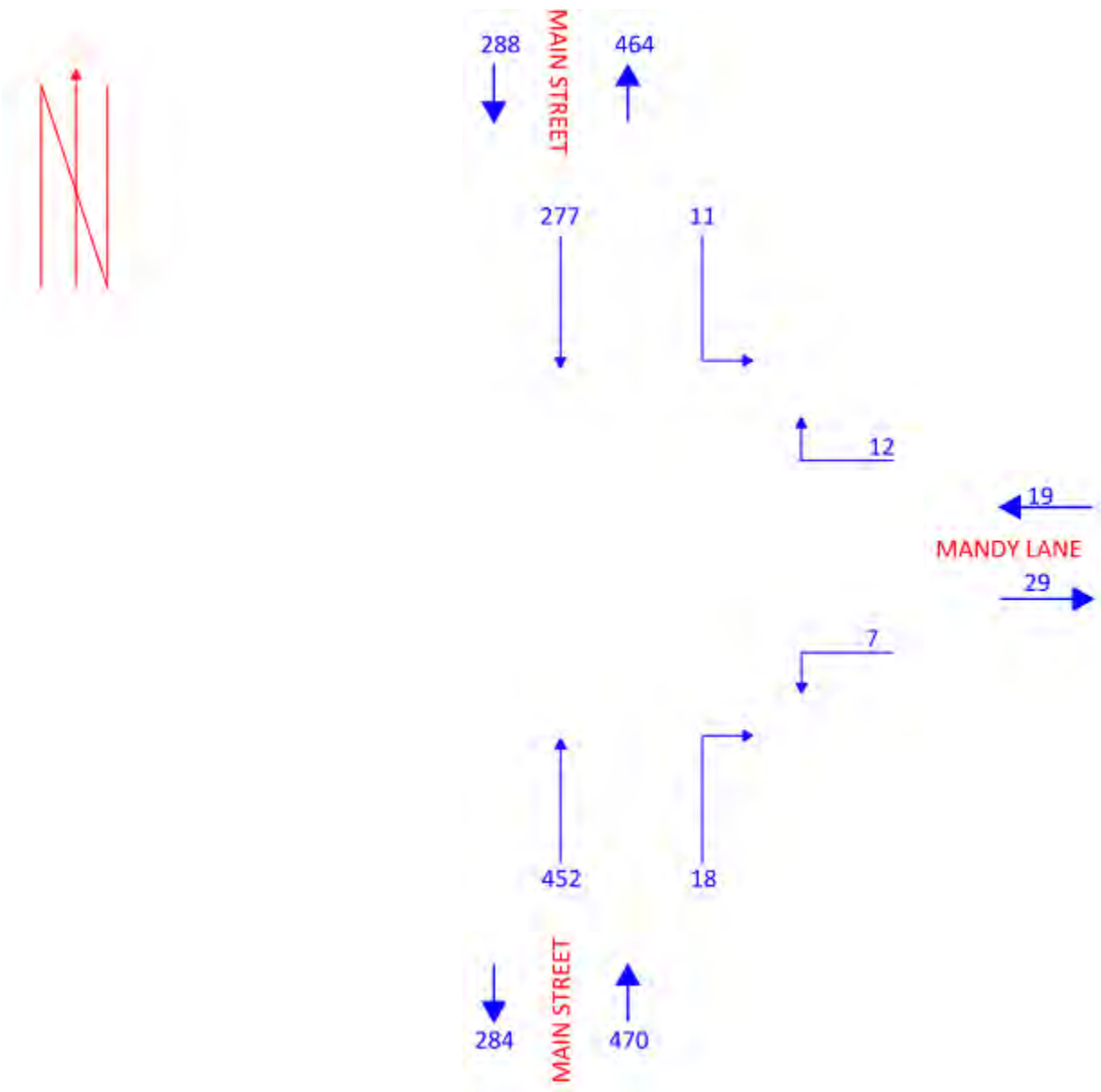


Exhibit 5.4.14 Mandy Lane & Main St. TMD - PM Peak Hour for Build Scenario (2023)

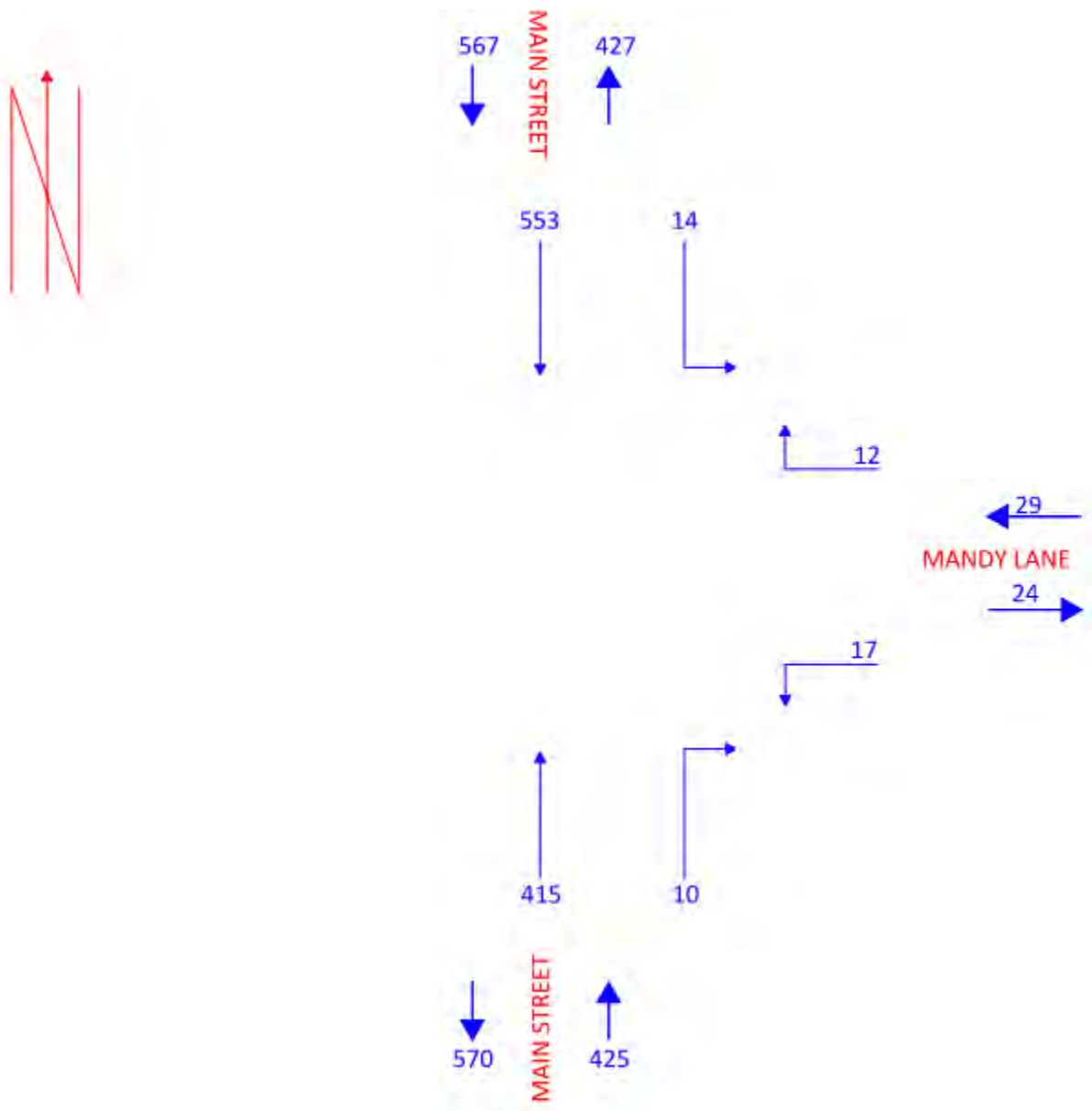


Exhibit 5.4.15 Tracker Rd. & Donald St. TMD - AM Peak Hour for Build Scenario (2023)

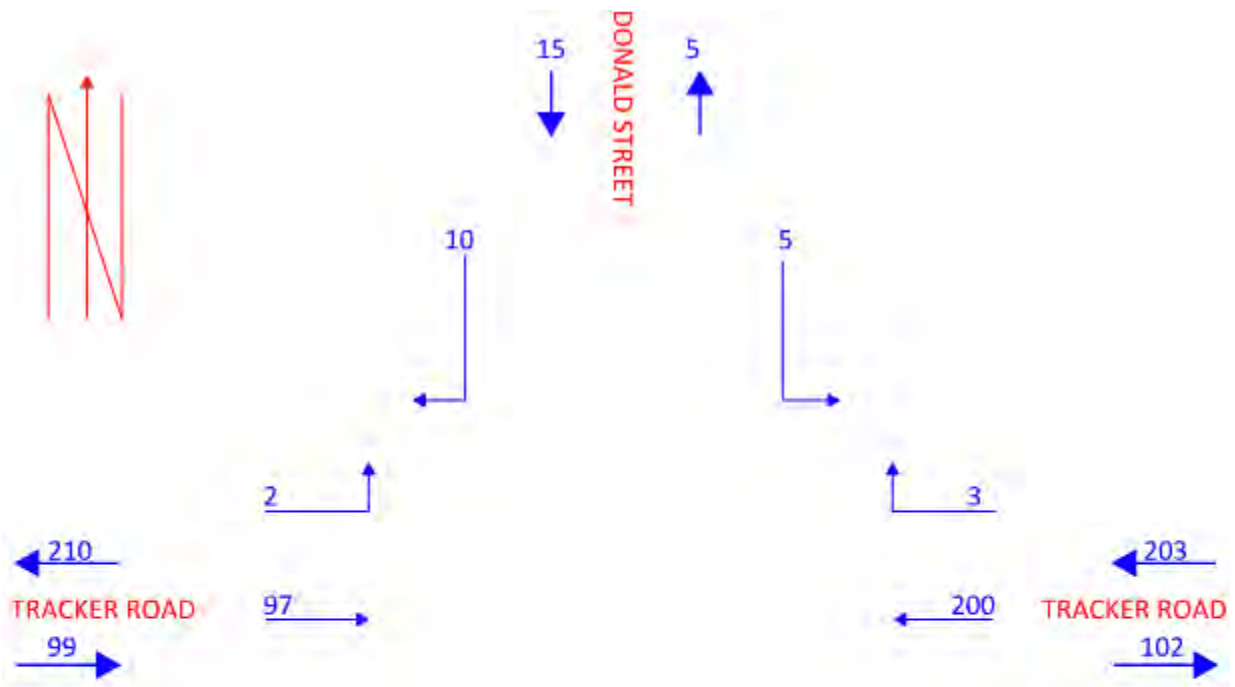


Exhibit 5.4.16 Tracker Rd. & Donald St. TMD - PM Peak Hour for Build Scenario (2023)

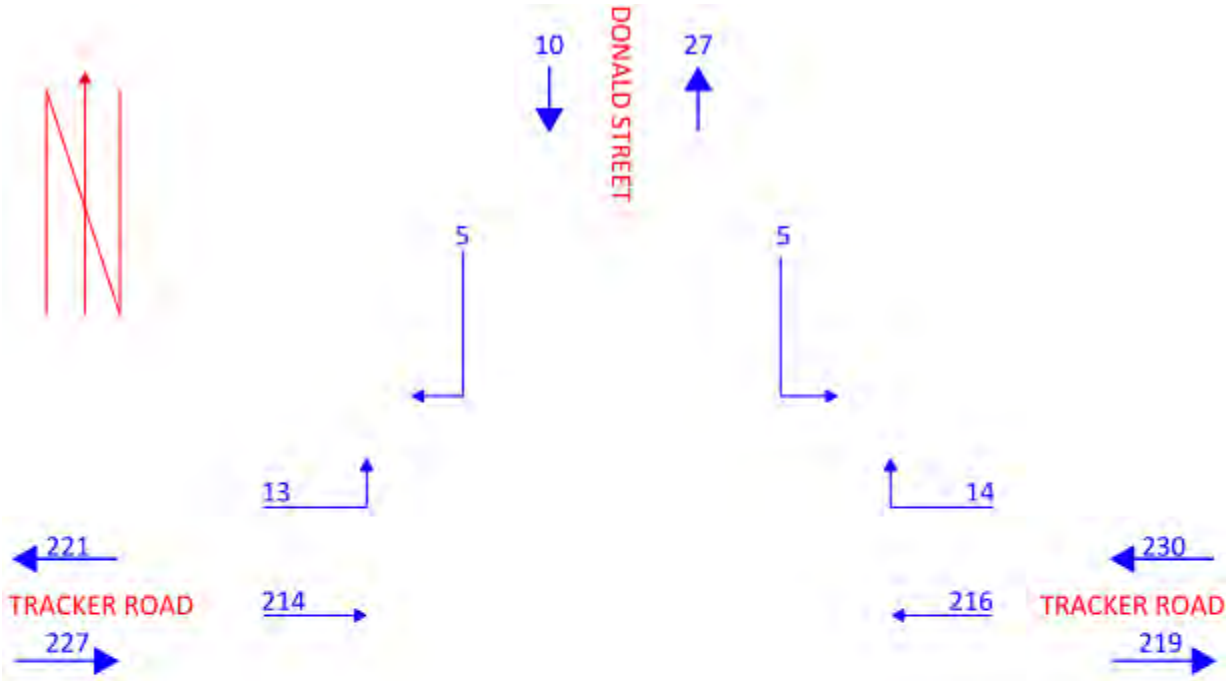


Exhibit 5.4.17 Tracker Rd. & Maxine Ave. TMD - AM Peak Hour for Build Scenario (2023)

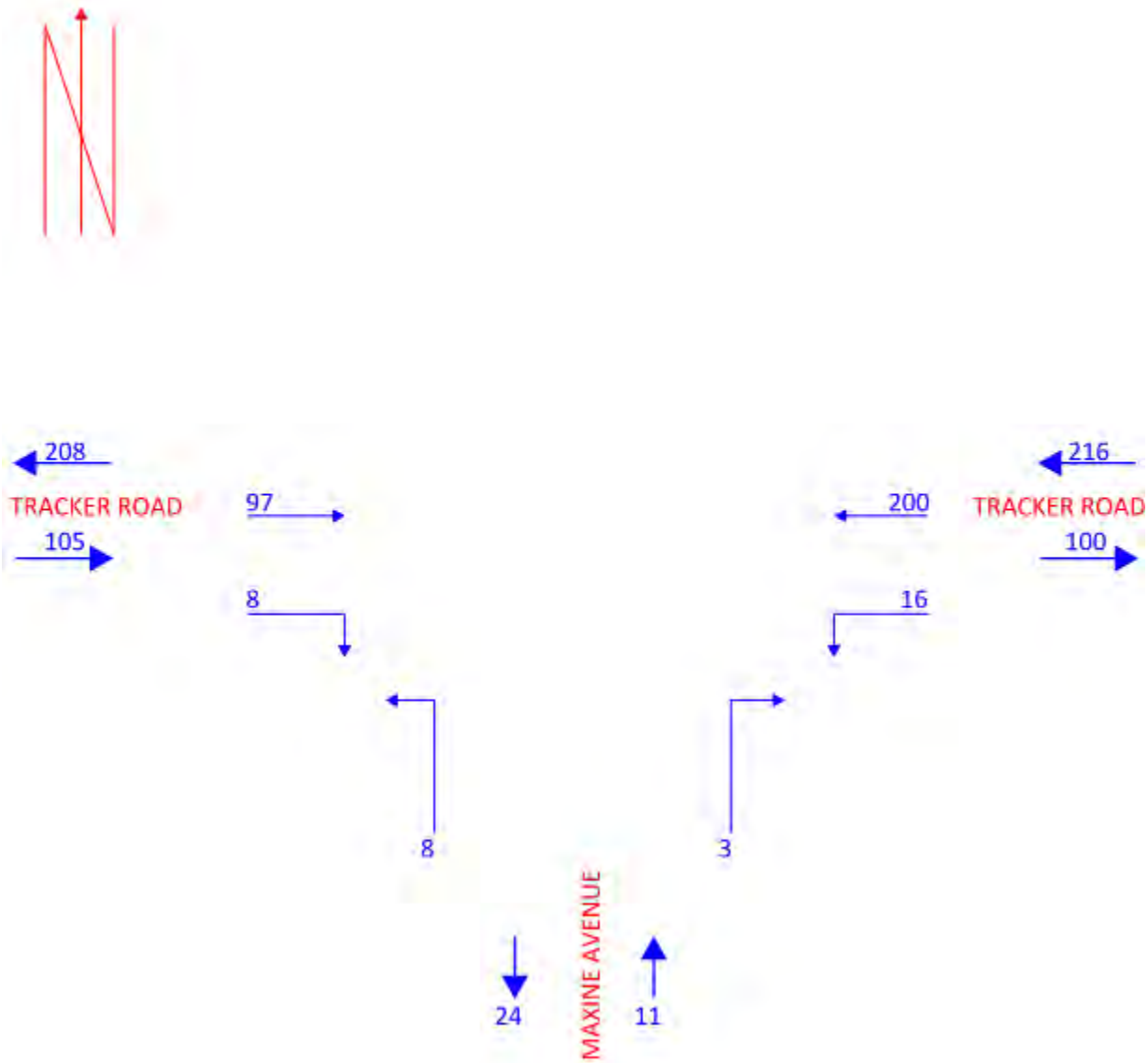
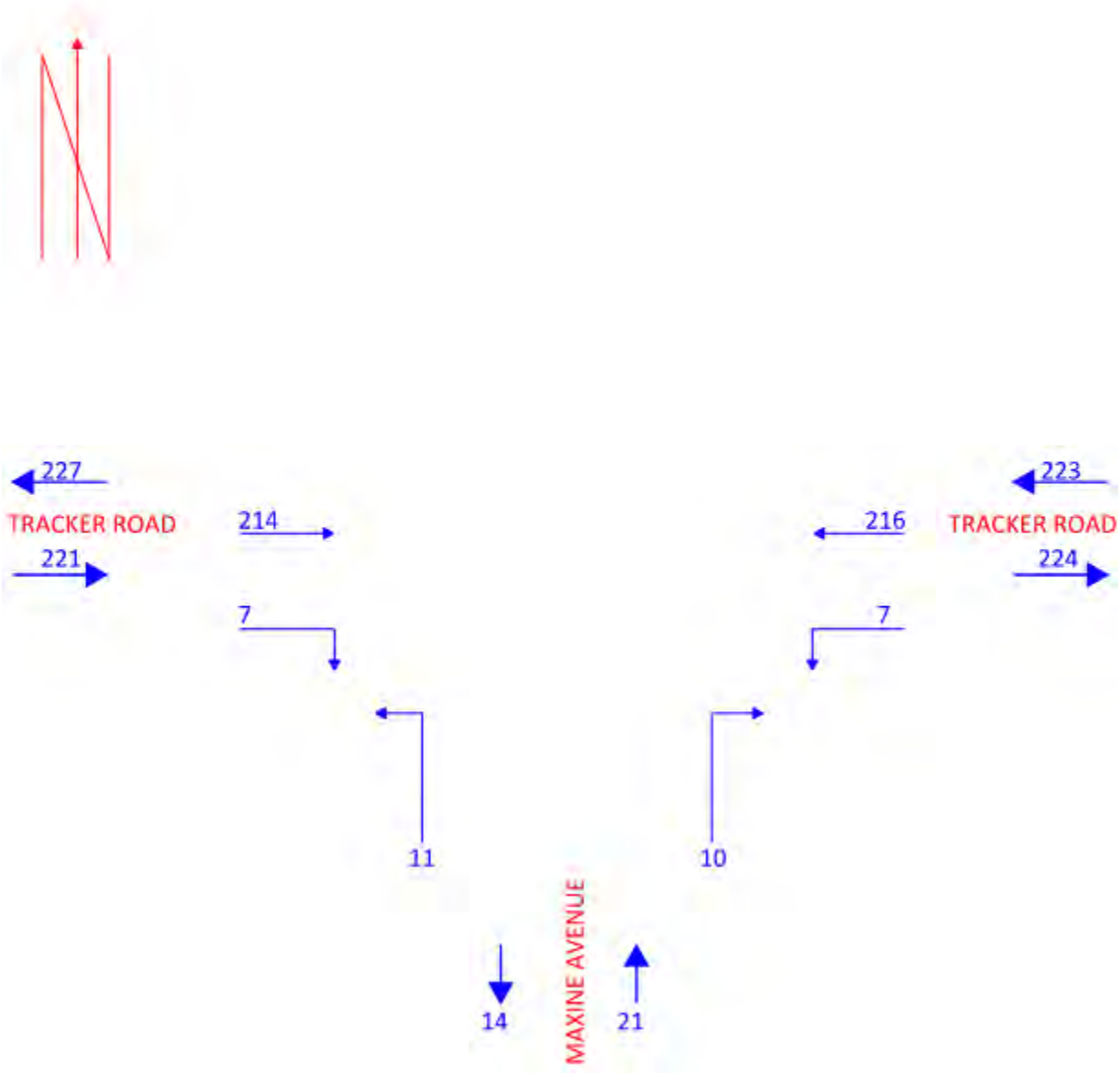


Exhibit 5.4.18 Tracker Rd. & Maxine Ave. TMD - PM Peak Hour for Build Scenario (2023)



The following ten exhibits depict the "Build Scenarios for the 2043 Year of Full Buildout Conditions.

Exhibit 5.4.19 Tracker Rd. & Main St. TMD - AM Peak Hour for Build Scenario (2043)

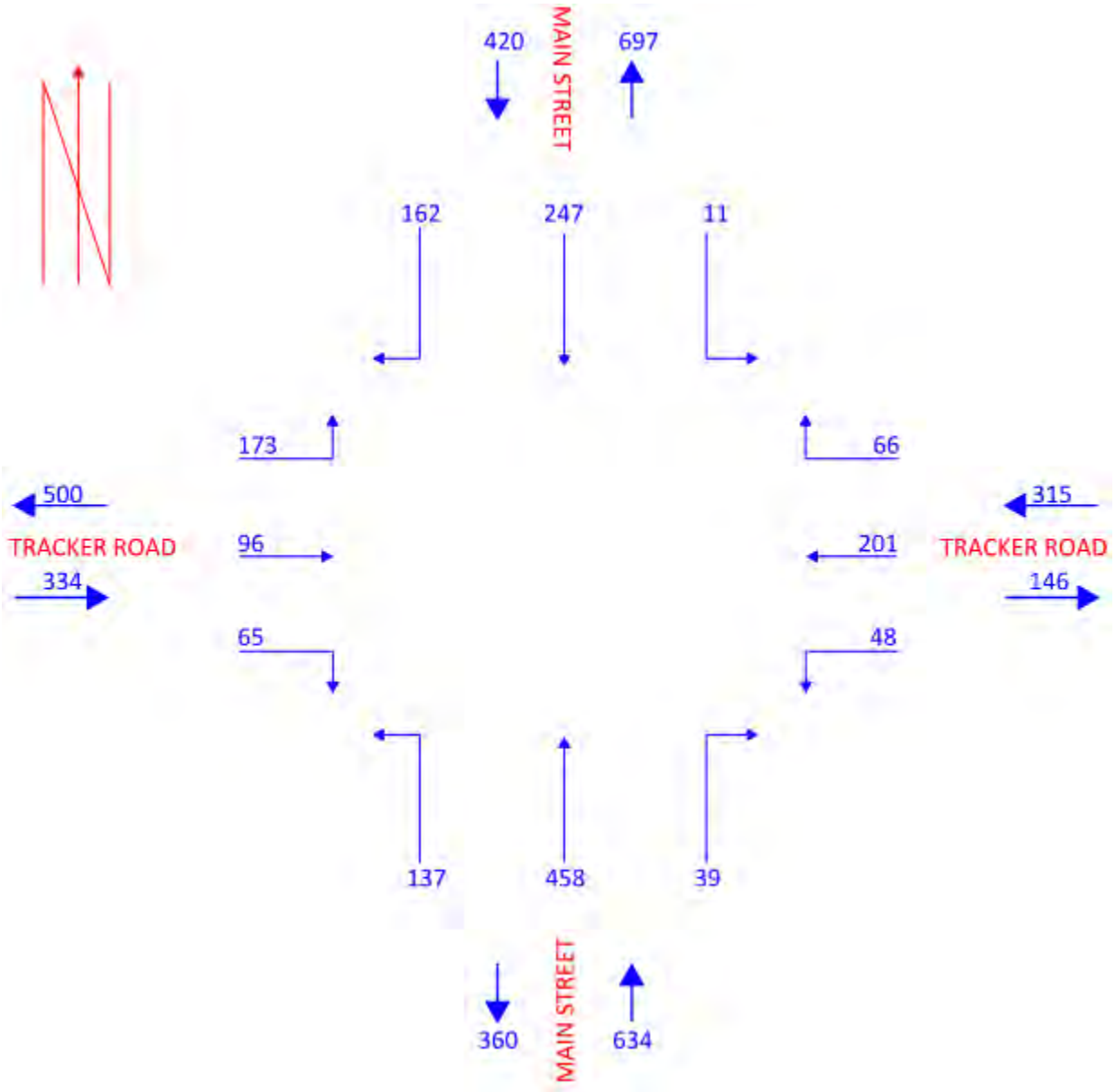


Exhibit 5.4.20 Tracker Rd. & Main St. TMD - PM Peak Hour for Build Scenario (2043)

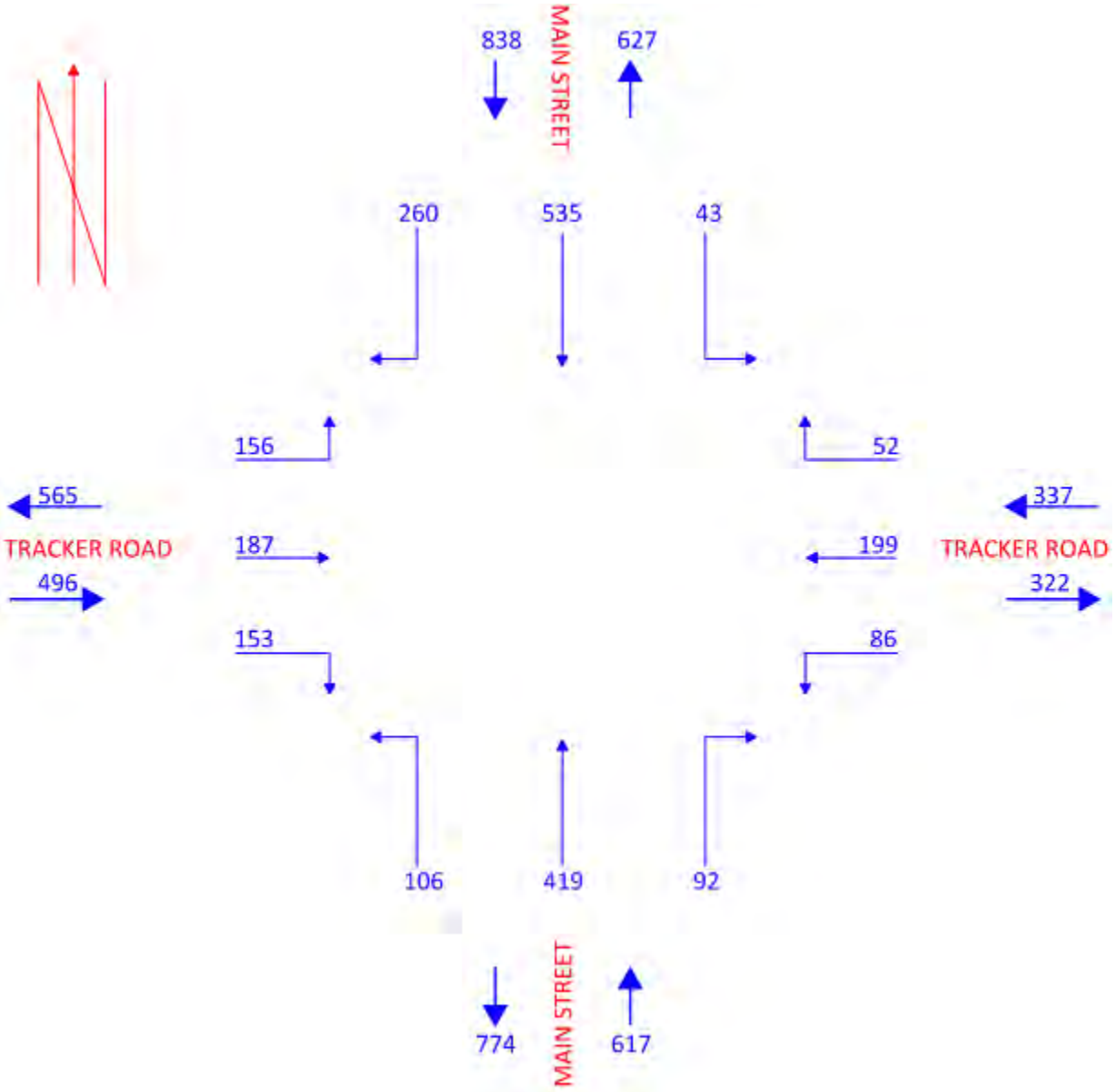


Exhibit 5.4.21 Greenbriar Drive. & Main St. TMD - AM Peak Hour for Build Scenario (2043)

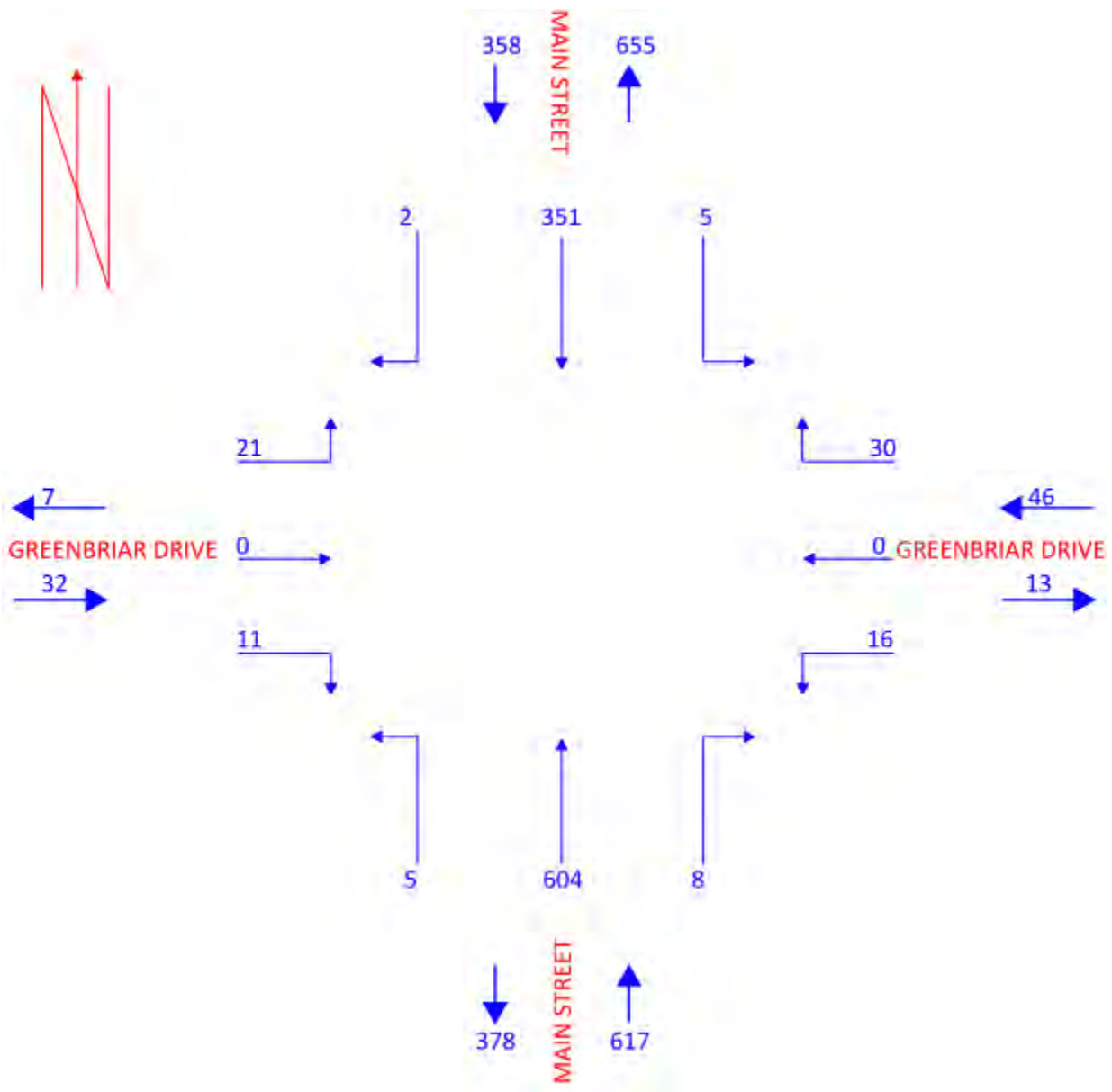


Exhibit 5.4.22 Greenbriar Drive. & Main St. TMD - PM Peak Hour for Build Scenario (2043)

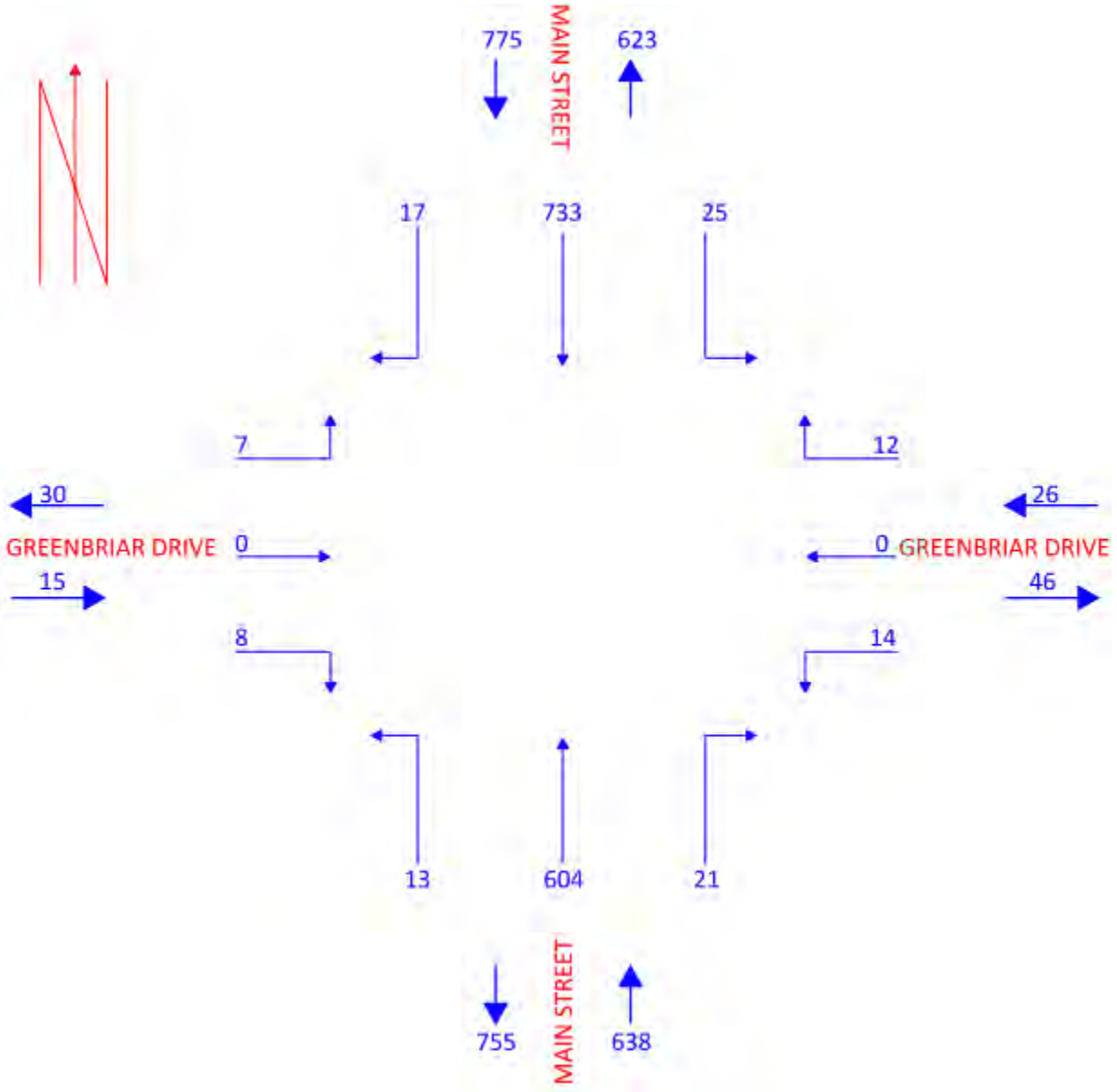


Exhibit 5.4.23 Mandy Lane & Main St. TMD - AM Peak Hour for Build Scenario (2043)

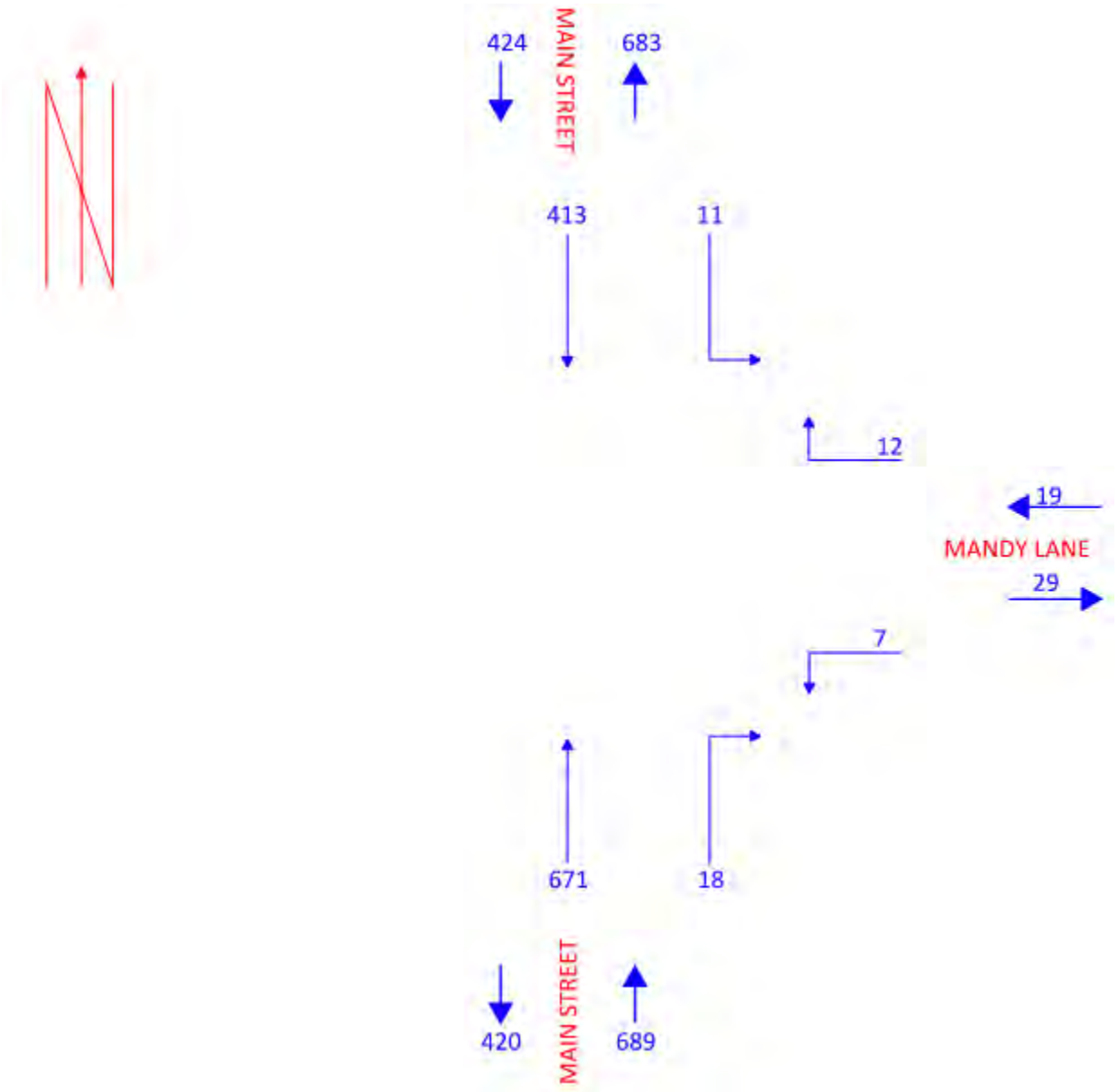


Exhibit 5.4.24 Mandy Lane & Main St. TMD - PM Peak Hour for Build Scenario (2043)

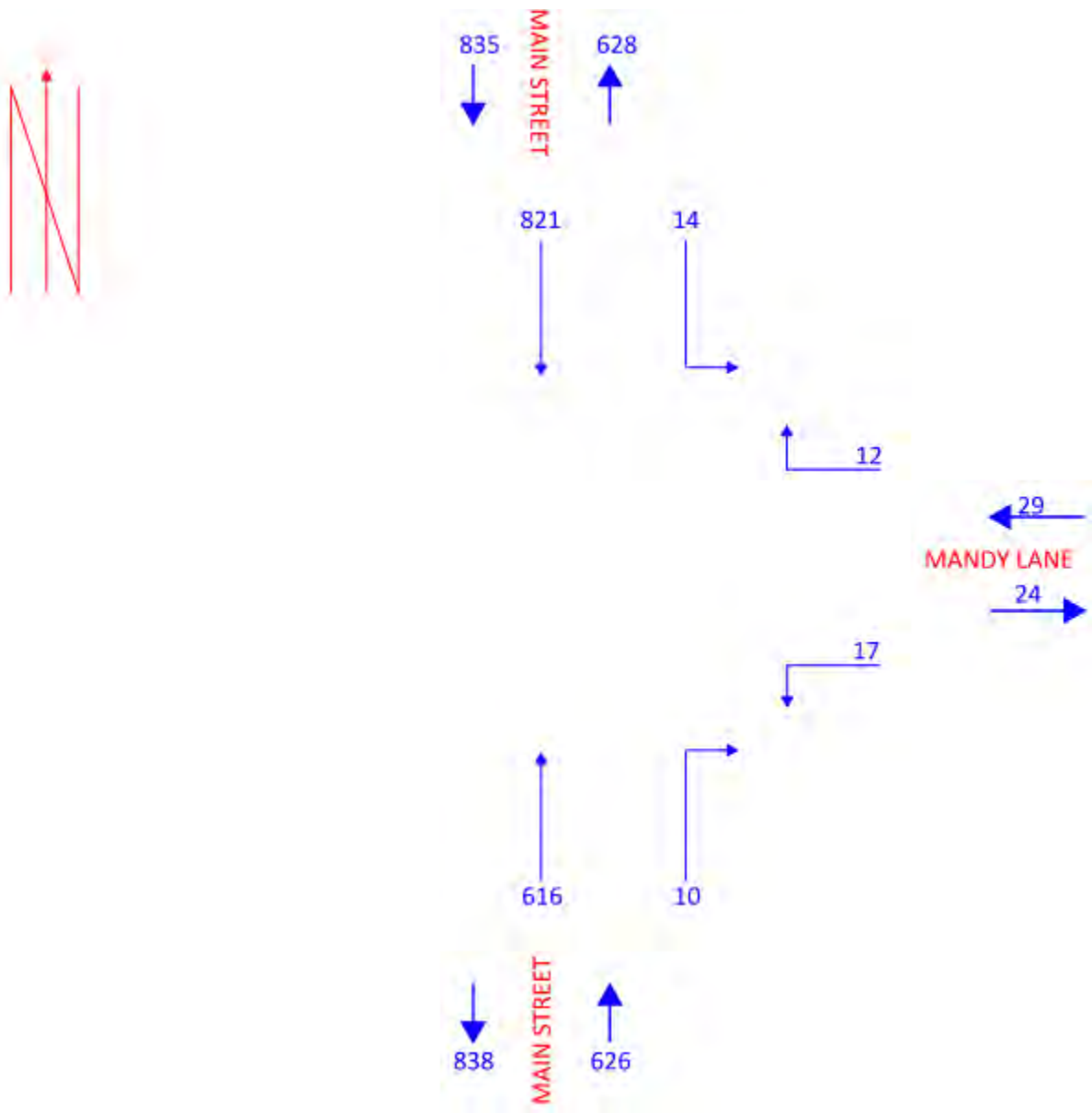


Exhibit 5.4.25 Tracker Rd. & Donald St. TMD - AM Peak Hour for Build Scenario (2043)

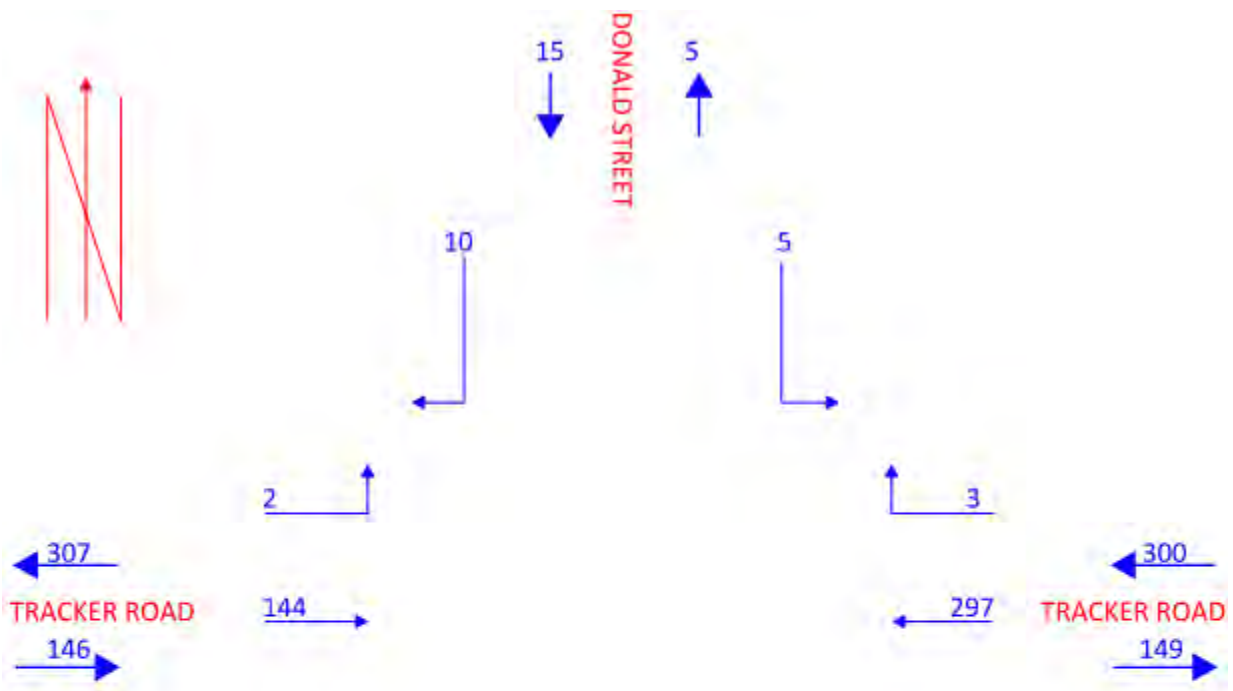


Exhibit 5.4.26 Tracker Rd. & Donald St. TMD - PM Peak Hour for Build Scenario (2043)

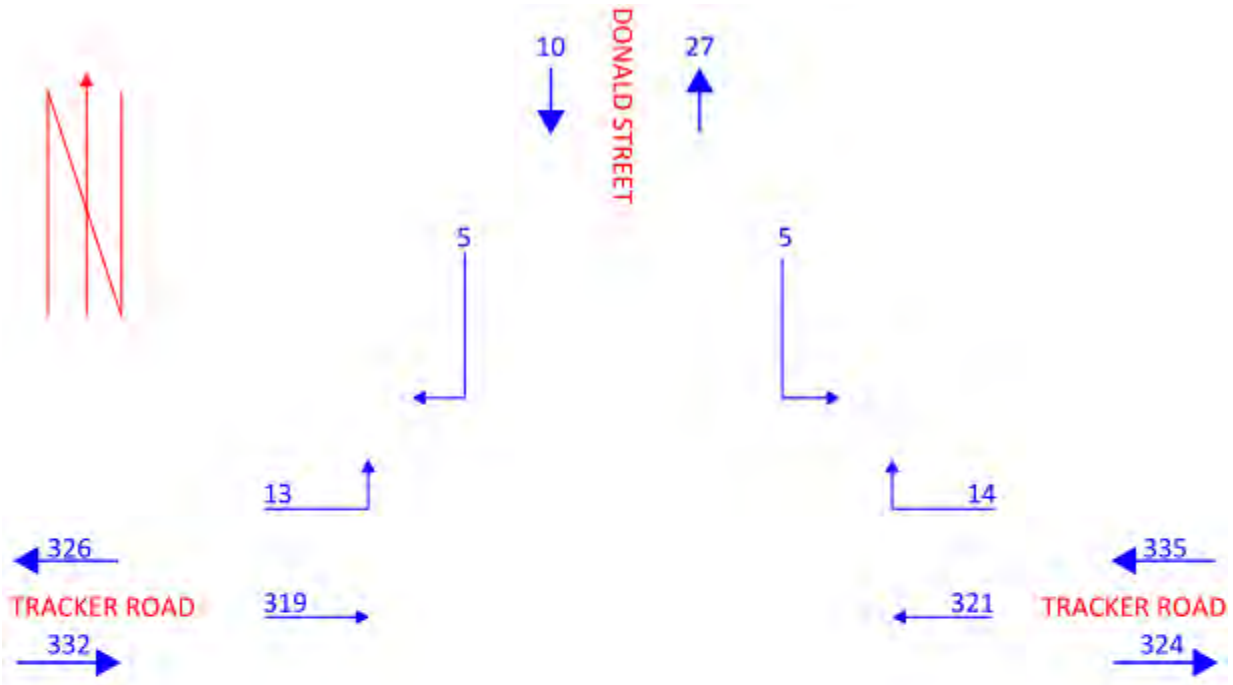


Exhibit 5.4.27 Tracker Rd. & Maxine Ave. TMD - AM Peak Hour for Build Scenario (2043)

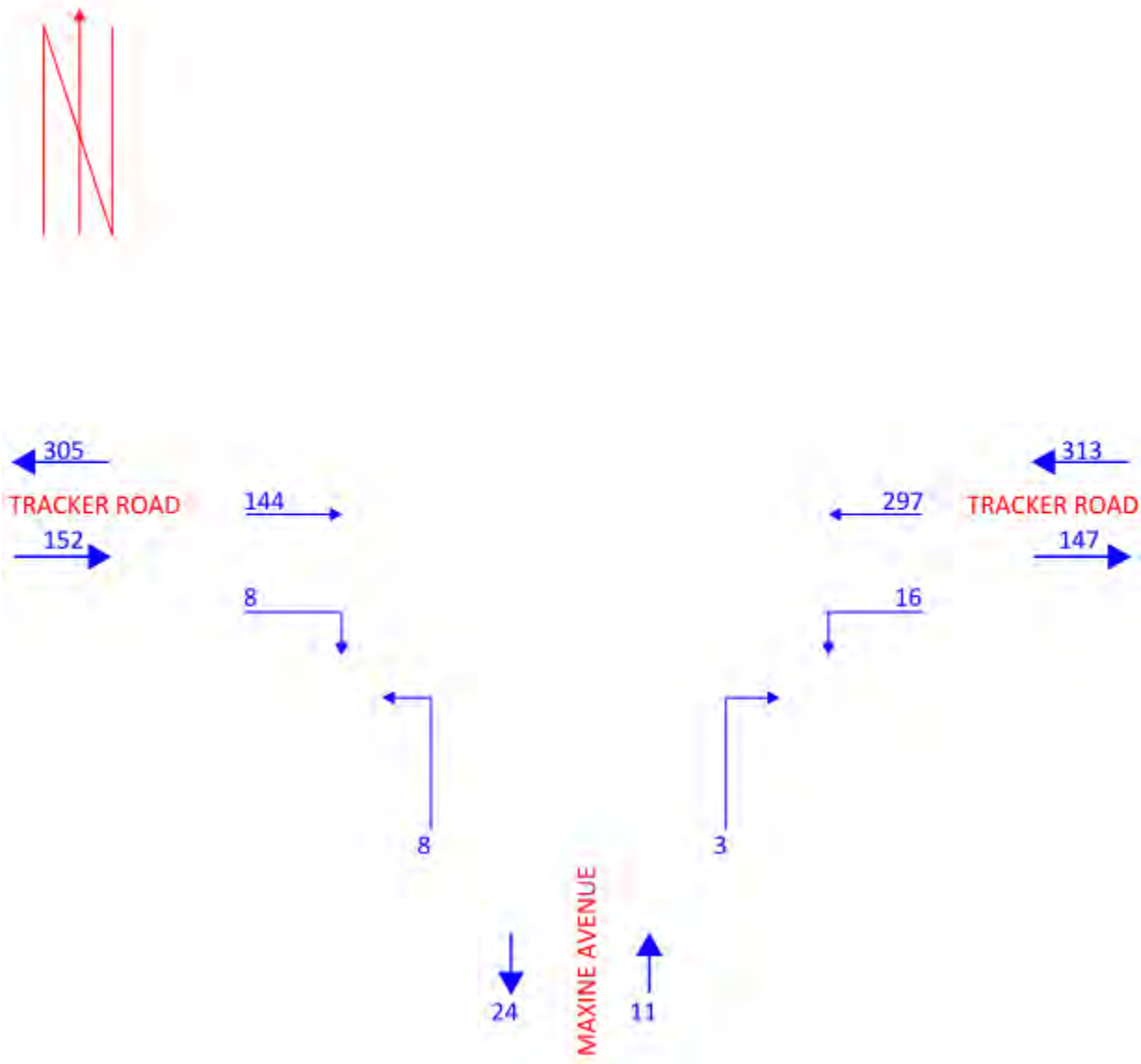
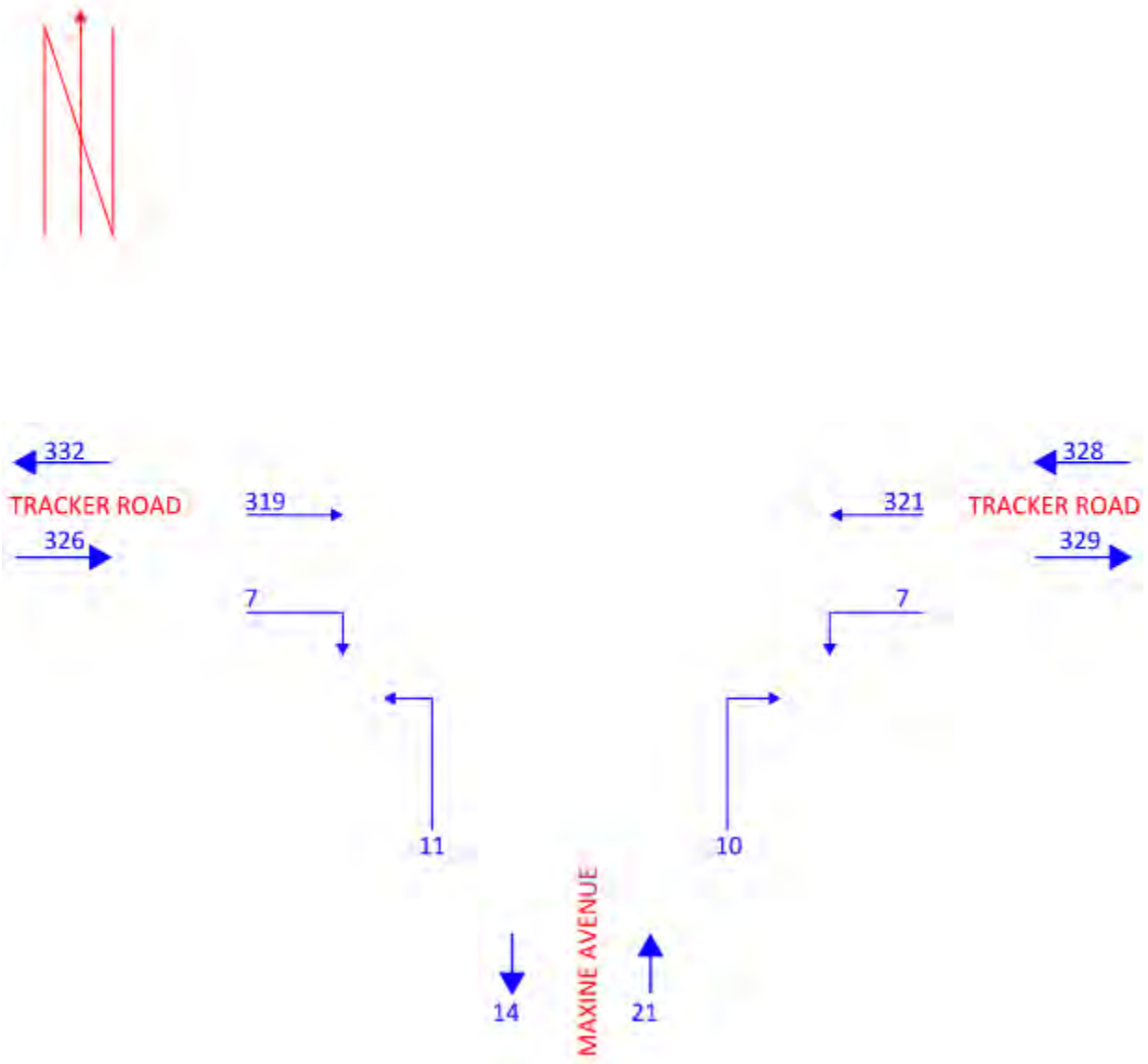


Exhibit 5.4.28 Tracker Rd. & Maxine Ave. TMD - PM Peak Hour for Build Scenario (2043)



6. CAPACITY ANALYSIS FOR THE STUDIED INTERSECTIONS

6.1 Existing and Proposed Scenarios for AM/PM

As mentioned previously in this report, conditions were analyzed for the following scenarios: Build and No Build scenarios for the years 2021, 2023, and 2043.

Using information provided in this report and from the field study, the capacities of select intersections were studied in detail and analyzed for future build conditions. Due to City Policy, all of the new intersections except for Greenbriar Drive and Main Street will be adding necessary turn lanes along the Collector (Main Street) and the Secondary Arterial (Tracker Road). It is anticipated that the city will make improvements in the future north of Tracker Road along Main Street, likely to make accommodations for a continuous turn lane from its intersection with Tracker Road north to an undetermined location. It is for that reason that a detailed capacity analysis was not performed for the Mandy Lane and Main Street intersection. Additionally, as the existing Greenbriar Drive and Main Street intersection has already been improved with the widening of Main Street to 3 lanes in that area, a detailed capacity analysis was not performed at that intersection.

The intersection of Tracker Road is currently a signalized intersection and was recently expanded. As this intersection already has a signal, the focus of the capacity calculations in this study have been on the remaining intersections proposed along Tracker Road. Should further analysis of this signalized intersection be required, additional site-specific information and further field analysis will be needed.

6.2 Existing and Future Level of Service

Traffic operations for the studied intersections were analyzed using procedures documented in the *Highway Capacity Manual (HCM) 6th Edition,* Transportation Research Board, 2016. From this analysis, a key predictor or "level of service" rating of the traffic operational conditions was obtained. In general, level of service (LOS) is a qualitative assessment of traffic operational conditions within a traffic stream in terms of average stopped delay per vehicle at a controlled intersection.

Levels of service are described by a letter designation of either A, B, C, D, E, or F, with LOS A representing essentially uninterrupted flow, and LOS F representing a breakdown of traffic flow with noticeable congestion and delay. Unsignalized, or stop sign controlled, intersection capacity analyses produce LOS results for each movement which must yield to conflicting traffic at the intersection. The table below summarizes LOS criteria for unsignalized (stop sign controlled) intersections.

Table 6.2.1: Level of Service (LOS) Criteria for Stop Sign Controlled Intersections

Level of Service	Average Control Delay per Vehicle (sec/veh)
	Stop Sign Controlled Intersections
A	≤ 10
B	> 10 to 15
C	> 15 to 25
D	> 25 to 35
E	> 35 to 50
F	> 50
HCM 6th Edition, Exhibit 20-2	

Calculations and guidance from the HCM were utilized to evaluate traffic operations at the aforementioned studied stop sign controlled intersections for this study. All intersection movements for both Tracker Road and Donald Street as well as for Tracker Road and Maxine Avenue are anticipated to perform at LOS B or better. Capacity calculations are shown in Appendix C of this study.

7. PARKING EVALUATION

7.1 Parking to be Provided on Site

A total of 323 parking stalls will be provided on site, over the General Commercial (GC) and Apartments (R3) proposed between the two subdivisions. To further break this down, 145 stalls are provided for the proposed apartments and 178 stalls are provided for the general commercial parcels.

7.2 Parking Required by Nixa City Code

According to the City of Nixa's Zoning Code, multifamily residential developments are required to provide 1.5 spaces per dwelling. The units provide a total of 145 stalls and are required to provide 143 stalls, thereby complying with Zoning regulations.

According to the aforementioned Zoning Code, commercial shopping plazas are required to provide 1 space per 250 square feet of gross floor area. The units provide a total of 178 stalls and are required to provide 150 stalls, thereby complying with Zoning regulations.

8. SIGHT DISTANCE REVIEW

This study has taken a preliminary step in considering the importance of stopping sight distances. Two areas of particular concern by the public are the proposed intersections of Mandy Lane and Main Street and that of Tracker Road and Donald Street.

8.1 Minimum Stopping Sight Distances Required

Based on design guidance from the AASHTO "Green Book" required stopping sight distances for both of the aforementioned intersections were analyzed. The required stopping sight distance for the intersection of Mandy Lane and Main Street is approximately 315 feet. This assumes a grade of 3% along Main Street to the north of the proposed intersection, and a posted speed limit of 40 MPH.

The required stopping sight distance for the intersection of Tracker Road and Donald Street is approximately 227 feet. This assumes a grade of 9% along Tracker Road to the east of the proposed intersection, and a posted speed limit of 30 MPH.

8.2 Stopping Sight Distances Provided

Based on the site survey and reconnaissance, the stopping sight distance provided by the placement of the intersection of Mandy Lane and Main Street is approximately 340'. In the same fashion, the stopping sight distance provided by the placement of the intersection of Tracker Road and Donald Street is approximately 335'.

According to the methodology provided herein, both of the proposed intersections of concern meet the required stopping sight distance.

8.3 Additional Recommendations

In both cases, measured sight distance satisfies the minimum requirements and is acceptable. For either access, tree trimming may be necessary within the right-of-way to ensure these acceptable sight lines.

9. SIGHT REVIEW

9.1 MUTCD Standards

Utilizing the Manual on Uniform Traffic Control Devices (MUTCD), 2009 Edition, taper distances for the three required left turn lanes were computed. Additionally, sidewalks and ramps will be provided throughout both of the subdivisions that will be designed to meet or exceed ADA standards. Based on the proposed amount of generated traffic at each of the two subdivisions, circulation throughout will be at acceptable levels for cars, trucks, buses, bicycles and pedestrians.

9.2 Site Circulation and Turning Templates

The subdivisions contain multiple cul-de-sacs that were laid out and will be designed to meet or exceed City of Nixa standards. Utilizing Autodesk's Civil 3D software, an Autoturn Analysis was performed throughout the proposed streets in both subdivisions. The design vehicle was a school bus with a width of 8 feet and a length of approximately 36 feet. Refer to the attached Exhibits 3 and 4 which depict wheel tracking for the design vehicle, as it traverses the subdivisions.

9.3 Site Conflicts

Site conflicts are expected to be minimal, as the R3 and GC zoned portions will each have more than sufficient parking spaces based on preliminary layouts. Street parking is expected to be minimal and sufficient signage shall be put in place in restricted areas with limited maneuverability.

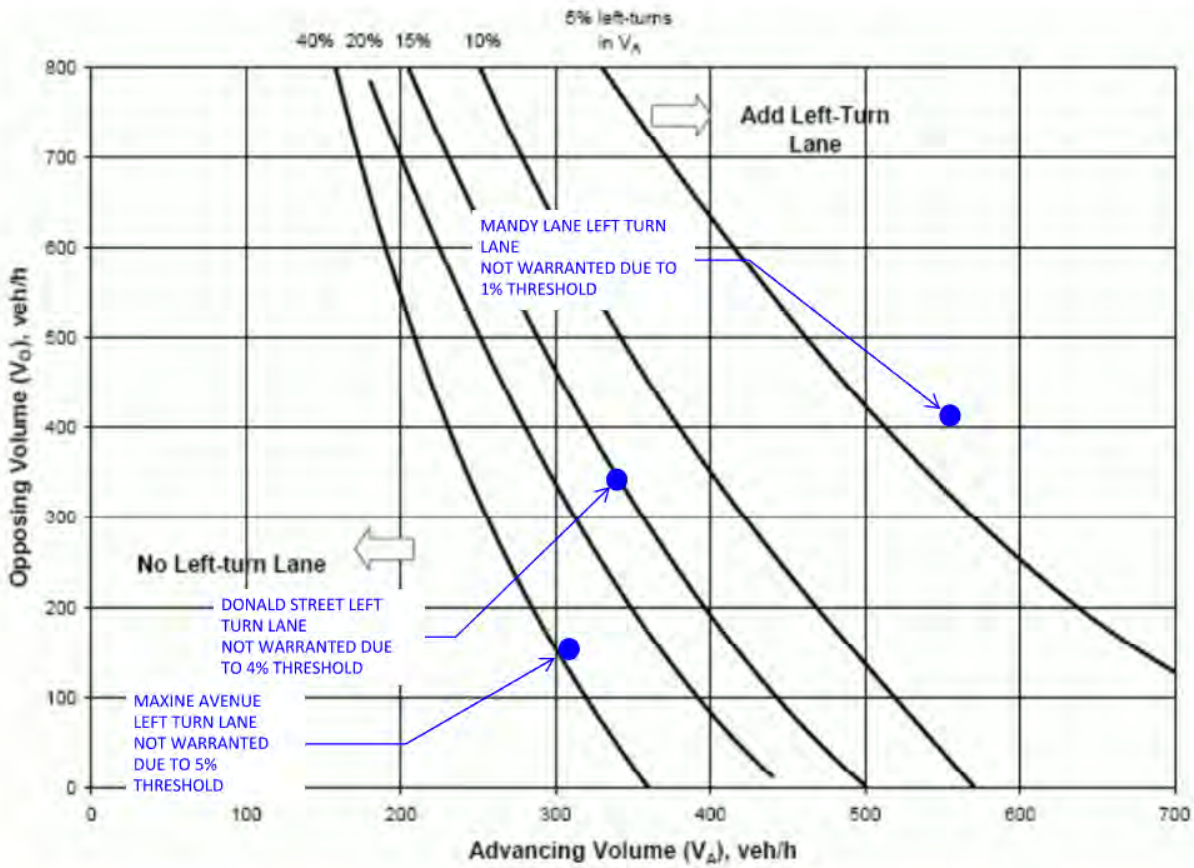
One defining aspect of both of the subdivisions is that of the known karst features on the properties. Nearly all aspects of the road layout, as well as the zoning and lot layouts relied on compatibility and safety in terms of adapting to the said karst features. The majority of the known karst features will be platted into common areas to be maintained by the future Property Owners Association or Home Owners Association.

10. MAIN FINDINGS OF THE STUDY

This study has shown the projected impacts that the two proposed subdivisions will have on the two existing studied intersections and the remaining proposed intersections throughout the course of the planned phasing. As can be seen in the attached Preliminary Plats (Exhibits 1 and 2 of this study), sufficient right of way (ROW) will be dedicated to bring both Tracker Road and Main Street up to current City of Nixa standard ROW widths. Additionally, based on City of Nixa policy, three dedicated left turn lanes with appropriate taper and storage lengths are being added. Two of the three turn lanes are added along Tracker Road, at Donald Street and Maxine Avenue, and the third will be added at along Main Street at Mandy Lane.

10.1 Right Turn and Left Turn Warrants

Based on the exhibit below, according to MoDOT's guidelines (940.9.1 in the MoDOT Engineering Policy Guide), left turn lanes are not warranted at the three aforementioned intersection locations.



11. SUMMARY OF FINDINGS AND RECOMMENDATIONS

As shown in Section 10 of this study, dedicated left turn lanes are not warranted for this development. However, the City of Nixa has stated that per City Policy (Resolution No. 2009-91), all roads classified as a collector or higher are required to meet the three lane road typical section outlined in the Ozarks Transportation Organization (OTO). Therefore, dedicated left turn lanes are proposed for this development. A preliminary layout for the proposed dedicated left turn lanes on Tracker Road and Main Street is shown on the attached Exhibit 5. A preliminary opinion of probable construction costs for the dedicated left turn lanes has been provided in Appendix A. The preliminary opinion of probable construction costs shows an estimated cost of $297,778 for these improvements. The City has mentioned that they have future plans to widen Main Street in this area. The City has asked the developer to consider widening Tracker Road from the intersection of Tracker and Main to the east end of the development in lieu of constructing the turn lane on Main Street. The cost to widen Tracker Road is estimated to exceed the cost to install the three individual left turn lanes. The developer is willing to support public road improvements in this area up to the amount of $300,000.

11.1 Geometric and Lane Recommendations to Accommodate Proposed Traffic Volume

Utilizing the AASHTO “Green Book”, and the MUTCD, a preliminary layout has been proposed for the three new turn lanes in question. Taper and deceleration lengths vary per the posted speed limit and are in line with AASHTO minimums. For detailed dimensions refer to Exhibit 5.

EXHIBITS

1. WALKER WOODS PRELIMINARY PLAT
2. WALKER ESTATES PRELIMINARY PLAT
3. WALKER WOODS AUTOTURN ANALYSIS
4. WALKER ESTATES AUTOTURN ANALYSIS
5. PROPOSED TURN LANE IMPROVEMENTS
6. OTO MAJOR THOROUGHFARE PLAN

TOTH & ASSOCIATES

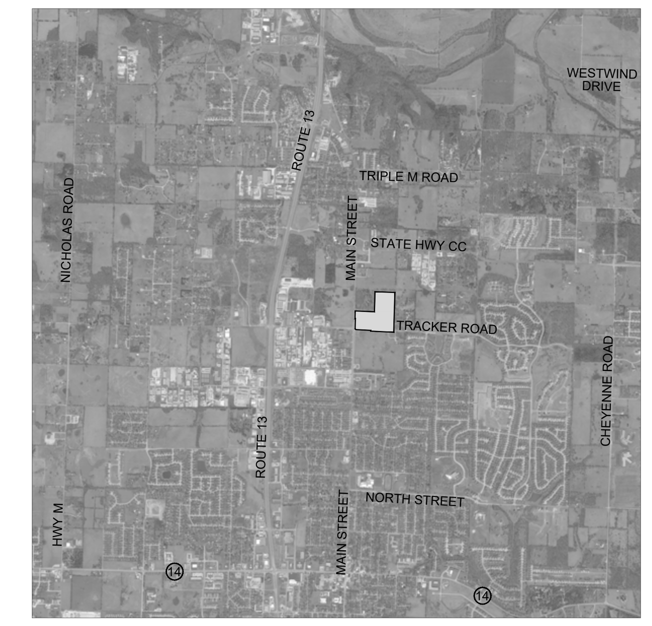
PRELIMINARY PLAT
WALKER WOODS SUBDIVISION

A SUBDIVISION IN THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 1, TOWNSHIP 27 NORTH, RANGE 22 WEST OF THE FIFTH PRINCIPAL MERIDIAN, CITY OF NIXA, CHRISTIAN COUNTY, STATE OF MISSOURI.

OWNER: DON E. WALKER AND LOIS M. WALKER

DEVELOPER: MORELOCK BUILDERS & ASSOCIATES

722 W. OLIVE STREET
SPRINGFIELD, MISSOURI 65806



LOCATION MAP
SCALE: 1" = 5000'

PROPERTY DESCRIPTION

ALL THAT PART OF THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 1 - TOWNSHIP 27 NORTH - RANGE 22 WEST OF THE FIFTH PRINCIPAL MERIDIAN, CHRISTIAN COUNT, STATE OF MISSOURI, DESCRIBED AS FOLLOWS: COMMENCING AT THE SOUTHEAST CORNER OF SAID SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER AND MEASURE N01°44'43"E ALONG THE EAST LINE THEREOF 1328.70 FEET TO THE NORTHEAST CORNER THEREOF; THENCE N87°47'06"W ALONG THE NORTH LINE THEREOF 15.0 FEET TO THE POINT OF BEGINNING; THENCE S01°44'43"W 1308.54 FEET TO A POINT ON THE NORTH RIGHT OF WAY LINE OF TRACKER ROAD; (THE FOLLOWING FOLLOWS THE NORTH R/W OF TRACKER ROAD) THENCE N87°10'30"W 754.49 FEET; THENCE N02°59'28"E 23.57 FEET; THENCE N87°04'01"W 490.18 FEET; THENCE N42°51'10"W 35.82 FEET TO A POINT ON THE EAST RIGHT OF WAY LINE OF MAIN STREET; (THE FOLLOWING FOLLOWS THE EAST R/W OF MAIN STREET) THENCE N01°27'03"E 339.90 FEET; THENCE N88°07'29"W 13.97 FEET; THENCE N02°01'18"E 242.62 FEET TO A POINT ON THE SOUTH LINE OF THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER; THENCE S87°30'09"E ALONG THE SOUTH LINE THEREOF 631.22 FEET TO THE SOUTHEAST CORNER THEREOF; THENCE N01°45'07"E ALONG THE EAST LINE THEREOF 661.06 FEET TO THE NORTHEAST CORNER THEREOF; THENCE S87°47'06"E ALONG THE NORTH LINE OF THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER 652.40 FEET TO THE POINT OF BEGINNING, CONTAINING 28.39 ACRES.

DATE OF PRELIMINARY PLAT SUBMITTAL:	JUNE 18, 2021
TOTAL ACREAGE OF THE DEVELOPMENT:	28.39
TOTAL NUMBER OF LOTS:	56
CURRENT ZONING:	R-1 (SINGLE FAMILY RESIDENTIAL DISTRICT) GC (GENERAL COMMERCIAL)
PROPOSED ZONING:	R-1 (SINGLE FAMILY RESIDENTIAL DISTRICT) GC (GENERAL COMMERCIAL)
R-1 SMALLEST LOT:	LOT 12, 10,000 SQUARE FEET
R-1 LARGEST LOT:	LOT 20, 20,611 SQUARE FEET

NOTES

1. MINIMUM LOT WIDTH IS 60 FEET FOR R-1 (SINGLE FAMILY RESIDENTIAL DISTRICT).
2. MINIMUM LOT WIDTH IS NONE FOR GC (GENERAL COMMERCIAL).
3. MINIMUM LOT SIZE IS 6,600 SQUARE FEET.
4. R-1 (SINGLE FAMILY RESIDENTIAL DISTRICT)
   25 FOOT BUILDING SETBACK LINE IN THE FRONT OF ALL LOTS.
   20 FOOT BUILDING SETBACK LINE IN THE REAR OF ALL LOTS.
   5 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS.
   12 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS WITH LOCAL STREET FRONTAGE.
5. GC (GENERAL COMMERCIAL)
   20 FOOT BUILDING SETBACK LINE IN THE FRONT OF ALL LOTS.
   20 FOOT BUILDING SETBACK LINE IN THE REAR OF ALL LOTS.
   10 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS.
   15 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS WITH LOCAL STREET FRONTAGE.
6. ROADS ARE TO BE DEDICATED FOR THE USE OF THE PUBLIC.
7. 10 FOOT UTILITY EASEMENT ON FRONT AND REAR OF ALL LOTS.
8. COMMON AREA (C1, C2, C3 & C4), ARE TO BE COMMON AREA.
9. APPROXIMATE LOCATION OF PROPOSED FIRE HYDRANT (TYPICAL).
10. PRELIMINARY SINKHOLE FLOOD OUTLINE FOR THE 100-YEAR FLOOD. SEE FLOOD PLAIN NOTE THIS SHEET.
11. PRELIMINARY SINKHOLE FLOOD OUTLINE FOR THE 500-YEAR FLOOD. SEE FLOOD PLAIN NOTE THIS SHEET.
12. APPROXIMATE LOCATION OF PROPOSED DETENTION AREAS (TYPICAL).
13. ROADS, UTILITIES AND OTHER ENGINEERING DESIGN ITEMS ARE SHOWN HEREON FOR PLANNING PURPOSES ONLY AND WILL BE DESIGNED SEPARATELY BY LICENSED ENGINEER.
14. PRE-EXISTING STRUCTURE LOCATED ON LOTS 21 AND 22 EXEMPT FROM SETBACK REQUIREMENTS UNTIL SUCH TIME AS STRUCTURE IS REMOVED, ALL NEW STRUCTURES MUST CONFORM TO LOT SETBACKS.
15. NO DIRECT ACCESS TO TRACKER ROAD OR MAIN STREET FROM ADJOINING LOTS. ALL LOT ACCESS MUST BE FROM ADJOINING STREETS WITHIN SUBDIVISION INTERIOR.

FLOOD NOTE

BY GRAPHIC PLOTTING ONLY, THIS PROPERTY IS IN ZONE X OF THE FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NO. 29043C0060C, WHICH BEARS AN EFFECTIVE DATE OF DECEMBER 17, 2010.

THE SINKHOLE FLOOD OUTLINES SHOWN FOR THE 100-YEAR AND 500-YEAR FLOODPLAINS ARE BASED ON THE PRELIMINARY FIRM PANEL 29043C0058D, WITH A PRELIMINARY DATE OF 2019/09/20 AND ARE USED AS A REFERENCE ONLY.

DECLARATION BY SURVEYOR

I, JOSEPH R. PULLIAM, DO HEREBY CERTIFY THAT THIS PRELIMINARY PLAT WAS PREPARED UNDER MY PERSONAL SUPERVISION FROM AN ACTUAL SURVEY OF THE LAND HEREIN, IN ACCORDANCE WITH THE CURRENT MISSOURI STANDARDS FOR PROPERTY BOUNDARY SURVEYS.

PHYSICAL EVIDENCE OF IMPROVEMENTS IS SHOWN FROM INFORMATION TAKEN BY VISUAL INSPECTION OF THE PREMISES. EASEMENTS SHOWN ARE THOSE WRITTEN, PROVIDED, OR DISCOVERED AND MAY NOT BE ALL INCLUSIVE. APPARENT OWNERSHIPS AS SHOWN ARE BASED UPON INFORMATION PROVIDED BY OTHERS AND DO NOT REPRESENT AN OPINION AS TO TITLE. THIS PRELIMINARY PLAT IS INTENDED FOR REVIEW AND PLANNING PURPOSES ONLY AND IS NOT TO BE USED BY ANYONE FOR CONVEYANCE OF LANDS OR TITLE OF REAL ESTATE.

COMMON AREA

COMMON AREAS DEPICTED ON THIS SUBDIVISION PLAT AS LOTS C1 THROUGH C4 SHALL BE CONVEYED IN FEE-TITLE TO THE HOME OWNERS ASSOCIATION FOR SAID SUBDIVISION FOLLOWING COMPLETION OF CONSTRUCTION AND THE RECORDING OF FINAL PLAT THEREOF. THESE COMMON AREAS ARE HEREAFTER RESTRICTED FROM ADDITIONAL SUBDIVIDING OR FROM THE CONSTRUCTION AND/OR ERECTION OF ANY STRUCTURE WHETHER PERMANENT OR TEMPORARY. THESE AREAS ARE TO BE RESERVED AND SET ASIDE IN PERPETUITY AS "GREEN SPACE", THE ONLY PERMITTED USE OF SAID AREAS BEING THE INSTALLATION OF LANDSCAPING, INCLUDING THE PLANTING OF TREES, AND GENERAL MAINTENANCE ACTIVITIES SUCH AS MOWING AND DEBRIS REMOVAL. ALL TAXES, EXPENSES AND OTHER COST RELATED TO THESE COMMON AREAS ARE THE SOLE RESPONSIBILITY OF THE HOMEOWNERS ASSOCIATION.

SINGLE FAMILY RESIDENTIAL DISTRICT

LOT #	SQ. FT.	AC.
1	10,047	0.23
2	10,010	0.23
3	11,440	0.26
4	11,440	0.26
5	11,356	0.26
6	14,074	0.32
7	13,396	0.31
8	12,758	0.29
9	13,842	0.32
10	10,010	0.23
11	10,010	0.23
12	10,000	0.23
13	15,384	0.35
14	11,416	0.26
15	8,925	0.20
16	9,608	0.22
17	10,673	0.25
18	10,220	0.23

SINGLE FAMILY RESIDENTIAL DISTRICT

LOT #	SQ. FT.	AC.
19	16,548	0.38
20	20,611	0.47
21	10,010	0.23
22	10,010	0.23
23	15,259	0.35
24	10,886	0.25
25	10,010	0.23
26	10,970	0.25
27	12,373	0.28
28	16,187	0.37
29	16,812	0.39
30	11,354	0.26
31	11,507	0.26
32	11,520	0.26
33	11,520	0.26
34	11,520	0.26
35	11,520	0.26
36	12,022	0.28

SINGLE FAMILY RESIDENTIAL DISTRICT

LOT #	SQ. FT.	AC.
37	13,898	0.32
38	12,284	0.28
39	12,493	0.29
40	14,007	0.32
41	14,984	0.34
42	10,010	0.23
43	10,010	0.23
44	10,578	0.24
45	11,175	0.26
46	11,018	0.25
47	9,724	0.22
48	9,724	0.22
49	9,724	0.22
50	9,724	0.22
51	9,724	0.22
52	9,724	0.22
53	9,724	0.22
54	9,857	0.23

GENERAL COMMERCIAL

LOT #	SQ. FT.	AC.
GC1	55,264	1.27
GC2	44,979	1.03

COMMON AREA

LOT #	SQ. FT.	AC.
C1	25,676	0.59
C2	83,615	1.92
C3	85,198	1.96
C4	149,140	3.42

LEGEND

ADJOINING PROPERTY LINE
UTILITY EASEMENT LINE
SETBACK LINE
SINKHOLE BOUNDARY
SINKHOLE
(NO CONSTRUCTION LIMITS)

BASIS OF BEARING

MISSOURI STATE PLANE
NAD 83 CENTRAL ZONE

VERTICAL DATUM = NAVD1988

N

0 50 100

NOTE: DRAWING REPRODUCTION AND SCALING MAY CHANGE THE INDICATED GRAPHIC SCALES
H. SCALE: 1" = 100'

MISSOURI ONE CALL SYSTEM
Call or Click Before You Dig!
1-800-DIG-RITE or 811
mo1call.com

#	REVISION	DATE

STATE OF MISSOURI
JOSEPH R. PULLIAM
NUMBER PLS-2006016641
PROFESSIONAL LAND SURVEYOR
06/17/2021

JOSEPH R. PULLIAM - LAND SURVEYOR
MO# PLS-2006016641

DWN. BY: BJS
CKD. BY: DCG
APPD. BY: JRP
DATE: 06/18/2021
SCALE: 1" = 100'
Graphic scale may change due to drawing reproduction

TOTH & ASSOCIATES
1550 E. REPUBLIC ROAD
SPRINGFIELD, MO 65804
Ph: 417-888-0645 Fax: 417-888-0657
www.tothassociates.com
CERTIFICATE OF AUTHORITY:
MO# LS-2011008797
© 2021 Toth and Associates, Inc.
Drawings and specifications are not intended for use on other projects at this site or other sites without written approval of the engineer

PROJECT: WALKER WOODS SUBDIVISION
LOCATION: CHRISTIAN COUNTY, MISSOURI
CLIENT: MORELOCK BUILDERS & ASSOCIATES
TITLE: PRELIMINARY PLAT
SHT NO: C-001

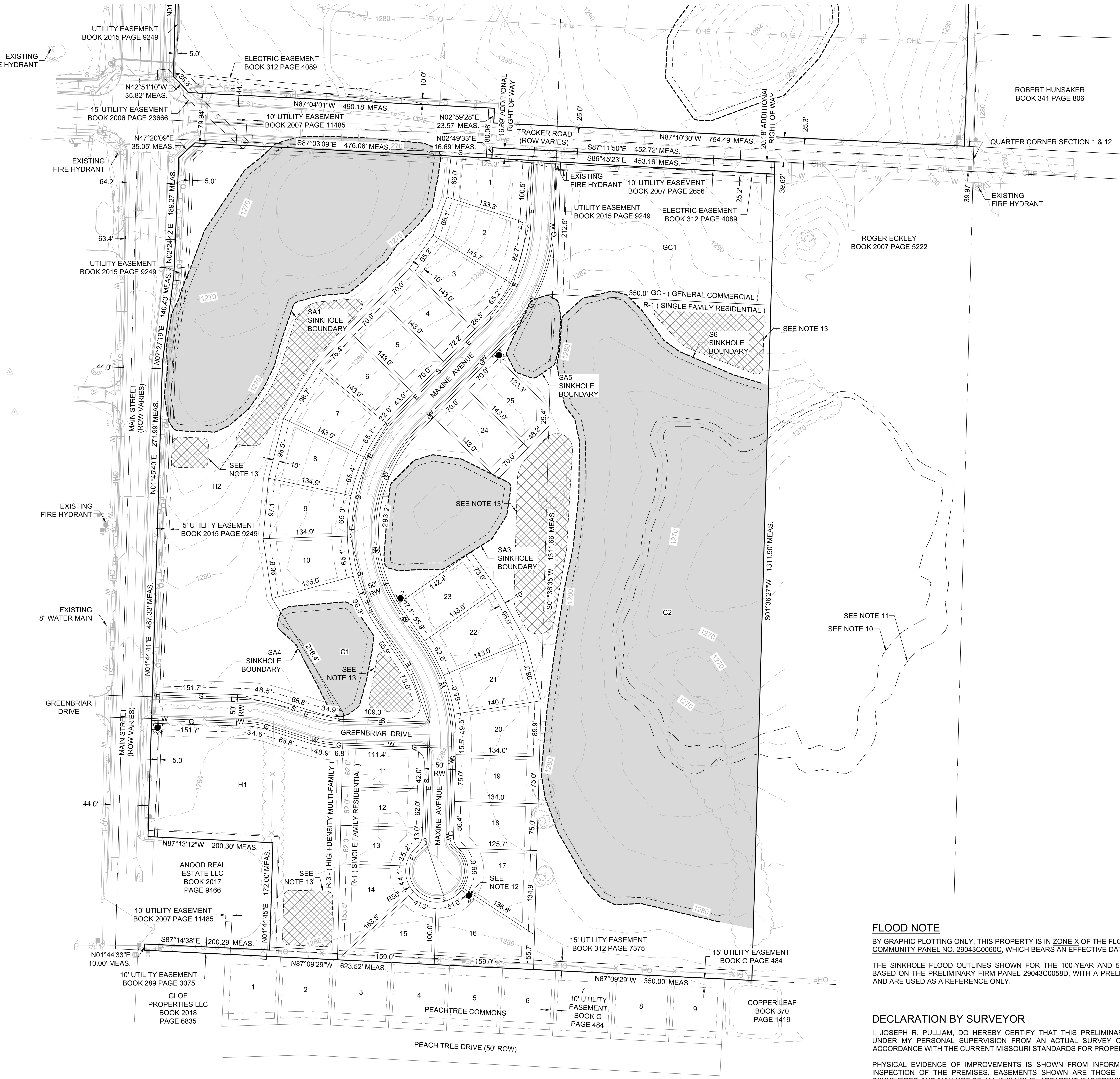
PRELIMINARY PLAT
WALKER ESTATES SUBDIVISION

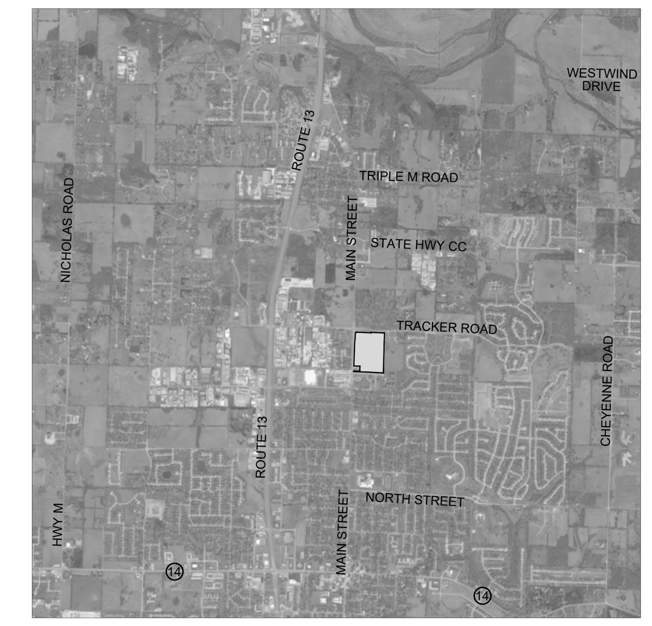
A SUBDIVISION IN THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 12, TOWNSHIP 27 NORTH, RANGE 22 WEST OF THE FIFTH PRINCIPAL MERIDIAN, CITY OF NIXA, CHRISTIAN COUNTY, STATE OF MISSOURI.

OWNER: DON E. WALKER AND LOIS M. WALKER

DEVELOPER: MORELOCK BUILDERS & ASSOCIATES

722 W. OLIVE STREET
SPRINGFIELD, MISSOURI 65806





LOCATION MAP
SCALE: 1" = 5000'

PROPERTY DESCRIPTION

ALL THAT PART OF THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 12 - TOWNSHIP 27 NORTH - RANGE 22 WEST OF THE FIFTH PRINCIPAL MERIDIAN, CHRISTIAN COUNT, STATE OF MISSOURI, DESCRIBED AS FOLLOWS: COMMENCING AT THE SOUTHWEST CORNER OF SAID NORTHEAST QUARTER OF THE NORTHWEST QUARTER AND MEASURE S87°09'29"E ALONG THE SOUTH LINE THEREOF 46.72 FEET TO A POINT ON THE EAST RIGHT OF WAY LINE OF MAIN STREET FOR THE POINT OF BEGINNING; THENCE N01°44'33"E ALONG SAID EAST RIGHT OF WAY LINE 10.00 FEET TO A POINT ON THE SOUTH LINE OF THAT TRACT OF LAND DESCRIBED IN BOOK 2017 ON PAGE 9466; THENCE S87°14'38"E ALONG SAID SOUTH LINE 200.29 FEET TO THE SOUTHEAST CORNER THEREOF: THENCE N01°44'45"W ALONG THE EAST LINE THEREOF 172.00 FEET TO THE NORTHEAST CORNER THEREOF; THENCE N87°13'12"W ALONG THE NORTH LINE THEREOF 200.30 FEET TO A POINT ON THE EAST RIGHT OF WAY LINE OF MAIN STREET; (THE FOLLOWING FOLLOWS THE EAST R/W OF MAIN STREET) THENCE N01°44'41"E 487.33 FEET; THENCE N01°45'40"E 271.99 FEET; THENCE N07°27'19"E 140.43 FEET; THENCE N02°24'42"E 189.27 FEET; THENCE N47°20'09"E 35.05 FEET TO A POINT ON THE SOUTH RIGHT OF WAY LINE OF TRACKER ROAD; (THE FOLLOWING FOLLOWS THE SOUTH R/W OF TRACKER ROAD) THENCE S87°03'09"E 476.06 FEET; THENCE N02°49'33"E 16.69 FEET; THENCE S87°11'50"E 452.72 FEET TO A POINT MARKING THE NORTHEAST CORNER OF THE WEST 350 FEET OF THE EAST HALF OF THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER; THENCE S01°36'27"W ALONG THE EAST LINE THEREOF 1311.90 FEET TO THE SOUTHEAST CORNER THEREOF, SAID POINT ON THE SOUTH LINE OF SAID NORTHEAST QUARTER OF THE NORTHWEST QUARTER; THENCE N87°09'29"W 973.52 FEET TO THE POINT OF BEGINNING, CONTAINING 28.17 ACRES.

DATE OF PRELIMINARY PLAT SUBMITTAL: JUNE 18, 2021

TOTAL ACREAGE OF THE DEVELOPMENT: 28.17

TOTAL NUMBER OF LOTS: 28

CURRENT ZONING: R-1 (SINGLE FAMILY RESIDENTIAL DISTRICT)
GC (GENERAL COMMERCIAL)
R-3 (HIGH-DENSITY MULTI-FAMILY)

PROPOSED ZONING: R-1 (SINGLE FAMILY RESIDENTIAL DISTRICT)
GC (GENERAL COMMERCIAL)
R-3 (HIGH-DENSITY MULTI-FAMILY)

R-1 SMALLEST LOT: LOT 13, 7,497 SQUARE FEET

R-1 LARGEST LOT: LOT 16, 15,077 SQUARE FEET

NOTES

1. MINIMUM LOT WIDTH IS 60 FEET FOR R-1 (SINGLE FAMILY RESIDENTIAL DISTRICT).
2. MINIMUM LOT WIDTH IS NONE FOR GC (GENERAL COMMERCIAL).
3. MINIMUM LOT SIZE IS 6,600 SQUARE FEET.
4. R-1 (SINGLE FAMILY RESIDENTIAL DISTRICT)
   25 FOOT BUILDING SETBACK LINE IN THE FRONT OF ALL LOTS.
   20 FOOT BUILDING SETBACK LINE IN THE REAR OF ALL LOTS.
   5 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS.
   12 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS WITH LOCAL STREET FRONTAGE.
5. GC (GENERAL COMMERCIAL)
   20 FOOT BUILDING SETBACK LINE IN THE FRONT OF ALL LOTS.
   20 FOOT BUILDING SETBACK LINE IN THE REAR OF ALL LOTS.
   10 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS.
   15 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS WITH LOCAL STREET FRONTAGE.
6. R-3 (HIGH-DENSITY MULTI-FAMILY)
   20 FOOT BUILDING SETBACK LINE IN THE FRONT OF ALL LOTS.
   12 FOOT BUILDING SETBACK LINE IN THE REAR OF ALL LOTS.
   8 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS.
   12 FOOT BUILDING SETBACK LINE ON THE SIDE OF ALL LOTS WITH LOCAL STREET FRONTAGE.
7. 10 FOOT UTILITY EASEMENT ON FRONT AND REAR OF ALL LOTS.
8. ROADS ARE TO BE DEDICATED FOR THE USE OF THE PUBLIC.
9. COMMON AREA (C1 & C2), ARE TO BE COMMON AREA.
10. PRELIMINARY SINKHOLE FLOOD OUTLINE FOR THE 100-YEAR FLOOD. SEE FLOOD PLAIN NOTE THIS SHEET.
11. PRELIMINARY SINKHOLE FLOOD OUTLINE FOR THE 500-YEAR FLOOD. SEE FLOOD PLAIN NOTE THIS SHEET.
12. APPROXIMATE LOCATION OF PROPOSED FIRE HYDRANT (TYPICAL).
13. APPROXIMATE LOCATION OF PROPOSED DETENTION AREAS (TYPICAL).
14. ROADS, UTILITIES AND OTHER ENGINEERING DESIGN ITEMS ARE SHOWN HEREON FOR PLANNING PURPOSES ONLY AND WILL BE DESIGNED SEPARATELY BY LICENSED ENGINEER.
15. NO DIRECT ACCESS TO TRACKER ROAD OR MAIN STREET FROM ADJOINING LOTS. ALL LOT ACCESS MUST BE FROM ADJOINING STREETS WITHIN SUBDIVISION INTERIOR.
16. THIS SUBDIVISION INCLUDES A REPLAT OF THAT PORTION OF NORTH SIDE INDUSTRIAL PARK INCLUDING NECESSARY VACATION OF ROADWAYS, EASEMENTS AND ALL COVENANTS / RESTRICTIONS ASSOCIATED THEREWITH.

FLOOD NOTE

BY GRAPHIC PLOTTING ONLY, THIS PROPERTY IS IN ZONE X OF THE FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NO. 29043C0060C, WHICH BEARS AN EFFECTIVE DATE OF DECEMBER 17, 2010.

THE SINKHOLE FLOOD OUTLINES SHOWN FOR THE 100-YEAR AND 500-YEAR FLOODPLAINS ARE BASED ON THE PRELIMINARY FIRM PANEL 29043C0058D, WITH A PRELIMINARY DATE OF 2019/09/20 AND ARE USED AS A REFERENCE ONLY.

DECLARATION BY SURVEYOR

I, JOSEPH R. PULLIAM, DO HEREBY CERTIFY THAT THIS PRELIMINARY PLAT WAS PREPARED UNDER MY PERSONAL SUPERVISION FROM AN ACTUAL SURVEY OF THE LAND HEREIN, IN ACCORDANCE WITH THE CURRENT MISSOURI STANDARDS FOR PROPERTY BOUNDARY SURVEYS.

PHYSICAL EVIDENCE OF IMPROVEMENTS IS SHOWN FROM INFORMATION TAKEN BY VISUAL INSPECTION OF THE PREMISES. EASEMENTS SHOWN ARE THOSE WRITTEN, PROVIDED, OR DISCOVERED AND MAY NOT BE ALL INCLUSIVE. APPARENT OWNERSHIPS AS SHOWN ARE BASED UPON INFORMATION PROVIDED BY OTHERS AND DO NOT REPRESENT AN OPINION AS TO TITLE. THIS PRELIMINARY PLAT IS INTENDED FOR REVIEW AND PLANNING PURPOSES ONLY AND IS NOT TO BE USED BY ANYONE FOR CONVEYANCE OF LANDS OR TITLE OF REAL ESTATE.

EASEMENT VACATION

BY APPROVAL OF THE FINAL PLAT OF WALKER ESTATES SUBDIVISION BY THE CITY OF NIXA ALL EXISTING PUBLIC UTILITY EASEMENTS AND PUBLIC ROAD RIGHT-OF-WAY (OF RECORD OR NOT OF RECORD) LOCATED WITHIN THE BOUNDARY OF SAID SUBDIVISION BUT NOT SPECIFICALLY CALLED OUT AND/OR GRAPHICALLY DEPICTED HEREON SHALL HENCEFORTH BECOME ABANDONED, DISSOLVED AND VACATED. ANY EXISTING UTILITY STRUCTURE, LINE OR APPURTENANCE REGARDLESS OF TYPE LOCATED WITHIN ANY HEREINAFTER VACATED EASEMENT OR RIGHT-OF-WAY MAY REMAIN IN PLACE UNTIL SUCH TIME AS REPAIR, UPGRADE OR RELOCATION BECOME NECESSARY. ONCE REPAIR, UPGRADE OR RELOCATION BECOME NECESSARY SAID UTILITY STRUCTURE MUST BE RELOCATED INTO ONE OF THE NEWLY ESTABLISHED EASEMENTS DEPICTED HEREON.

COMMON AREA

COMMON AREAS DEPICTED ON THIS SUBDIVISION PLAT AS LOTS C1 THROUGH C2 SHALL BE CONVEYED IN FEE-TITLE TO THE HOME OWNERS ASSOCIATION FOR SAID SUBDIVISION FOLLOWING COMPLETION OF CONSTRUCTION AND THE RECORDING OF FINAL PLAT THEREOF. THESE COMMON AREAS ARE HEREAFTER RESTRICTED FROM ADDITIONAL SUBDIVIDING OR FROM THE CONSTRUCTION AND/OR ERECTION OF ANY STRUCTURE WHETHER PERMANENT OR TEMPORARY. THESE AREAS ARE TO BE RESERVED AND SET ASIDE IN PERPETUITY AS “GREEN SPACE”, THE ONLY PERMITTED USE OF SAID AREAS BEING THE INSTALLATION OF LANDSCAPING, INCLUDING THE PLANTING OF TREES, AND GENERAL MAINTENANCE ACTIVITIES SUCH AS MOWING AND DEBRIS REMOVAL. ALL TAXES, EXPENSES AND OTHER COST RELATED TO THESE COMMON AREAS ARE THE SOLE RESPONSIBILITY OF THE HOMEOWNERS ASSOCIATION.

SINGLE FAMILY RESIDENTIAL DISTRICT

LOT #	SQ. FT.	AC.
1	10,602	0.24
2	11,613	0.27
3	11,613	0.27
4	10,170	0.23
5	10,009	0.23
6	10,069	0.23
7	11,540	0.26
8	11,192	0.26
9	10,789	0.25
10	10,758	0.25
11	8,057	0.18
12	8,129	0.19
13	7,497	0.17

SINGLE FAMILY RESIDENTIAL DISTRICT

LOT #	SQ. FT.	AC.
14	11,148	0.26
15	10,670	0.24
16	15,077	0.35
17	11,328	0.26
18	10,002	0.23
19	10,050	0.23
20	10,492	0.24
21	11,409	0.26
22	11,114	0.26
23	10,435	0.24
24	10,010	0.23
25	9,794	0.22

COMMON AREA

LOT #	SQ. FT.	AC.
C1	28,919	0.66
C2	448,246	10.29

GENERAL COMMERCIAL

LOT #	SQ. FT.	AC.
GC1	72,410	1.66

HIGH-DENSITY MULTI-FAMILY

LOT #	SQ. FT.	AC.
H1	75,979	1.74
H2	237,464	5.45

LEGEND

ADJOINING PROPERTY LINE
UTILITY EASEMENT LINE
SETBACK LINE
SINKHOLE BOUNDARY
SINKHOLE (NO CONSTRUCTION LIMITS)

BASIS OF BEARING

MISSOURI STATE PLANE
NAD 83 CENTRAL ZONE

VERTICAL DATUM = NAVD1988

N
0 50 100
NOTE: DRAWING REPRODUCTION AND SCALING MAY CHANGE THE INDICATED GRAPHIC SCALES
H. SCALE: 1" = 100'

MISSOURI ONE CALL SYSTEM
Call or Click Before You Dig!
1-800-DIG-RITE or 811
mo1call.com

#	REVISION	DATE

JOSEPH R. PULLIAM - LAND SURVEYOR
MO# PLS-2006016641

DWN. BY: BJS
CKD. BY: DCG
APPD. BY: JRP
DATE: 06/18/2021
SCALE: 1" = 100'
Graphic scale may change due to drawing reproduction

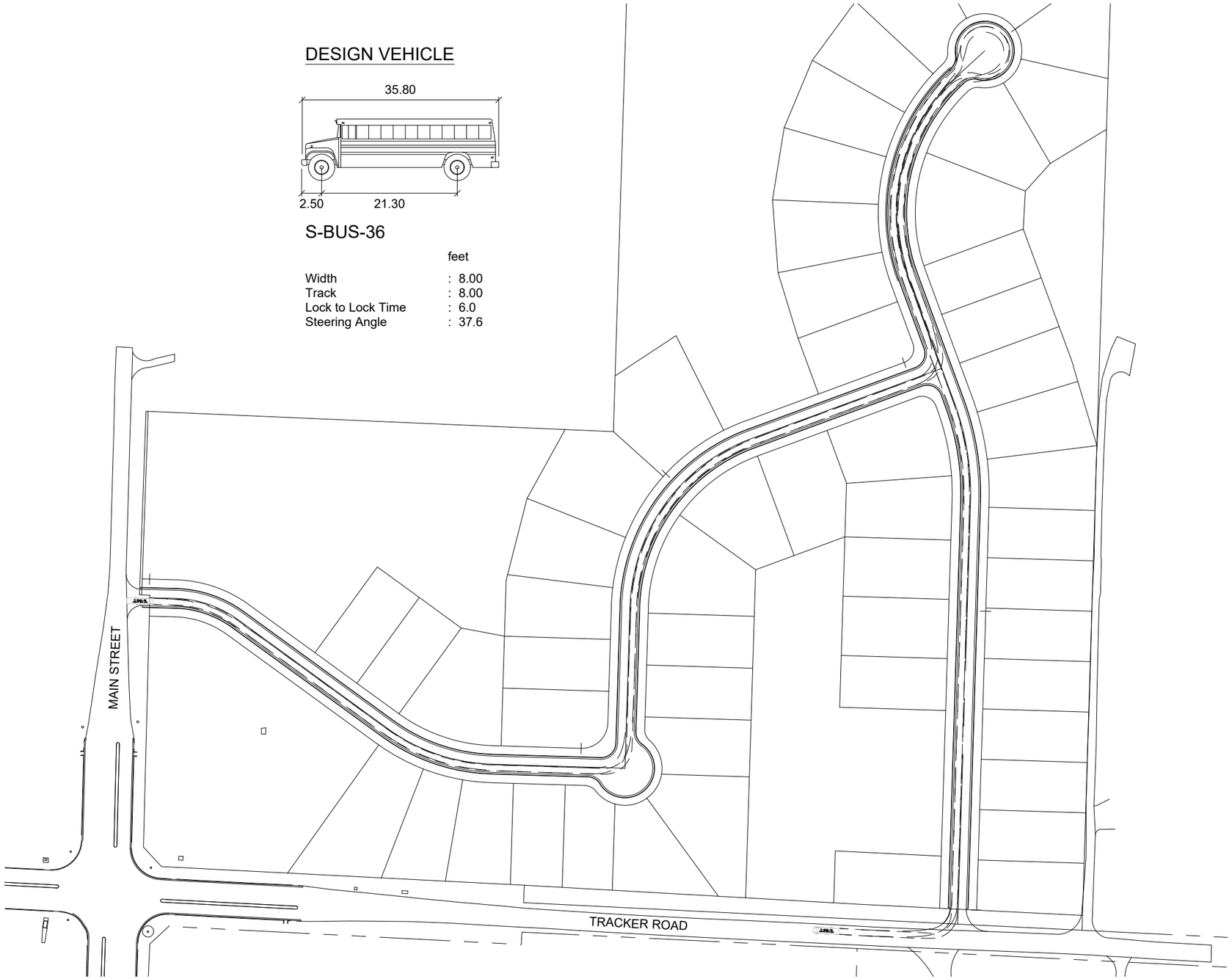
TOTH & ASSOCIATES
1550 E. REPUBLIC ROAD
SPRINGFIELD, MO 65804
Ph: 417-888-0645 Fax: 417-888-0657
www.tothassociates.com
CERTIFICATE OF AUTHORITY:
MO# LS-2011008797
© 2021 Toth and Associates, Inc.
Drawings and specifications are not intended for use on other projects at this site or other sites without written approval of the engineer

PROJECT: WALKER ESTATES SUBDIVISION
LOCATION: CHRISTIAN COUNTY, MISSOURI
CLIENT: MORELOCK BUILDERS & ASSOCIATES
TITLE: PRELIMINARY PLAT
SHT NO: C-001

DESIGN VEHICLE

S-BUS-36

	feet
Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 37.6



SCALE: 1" = 150'

N

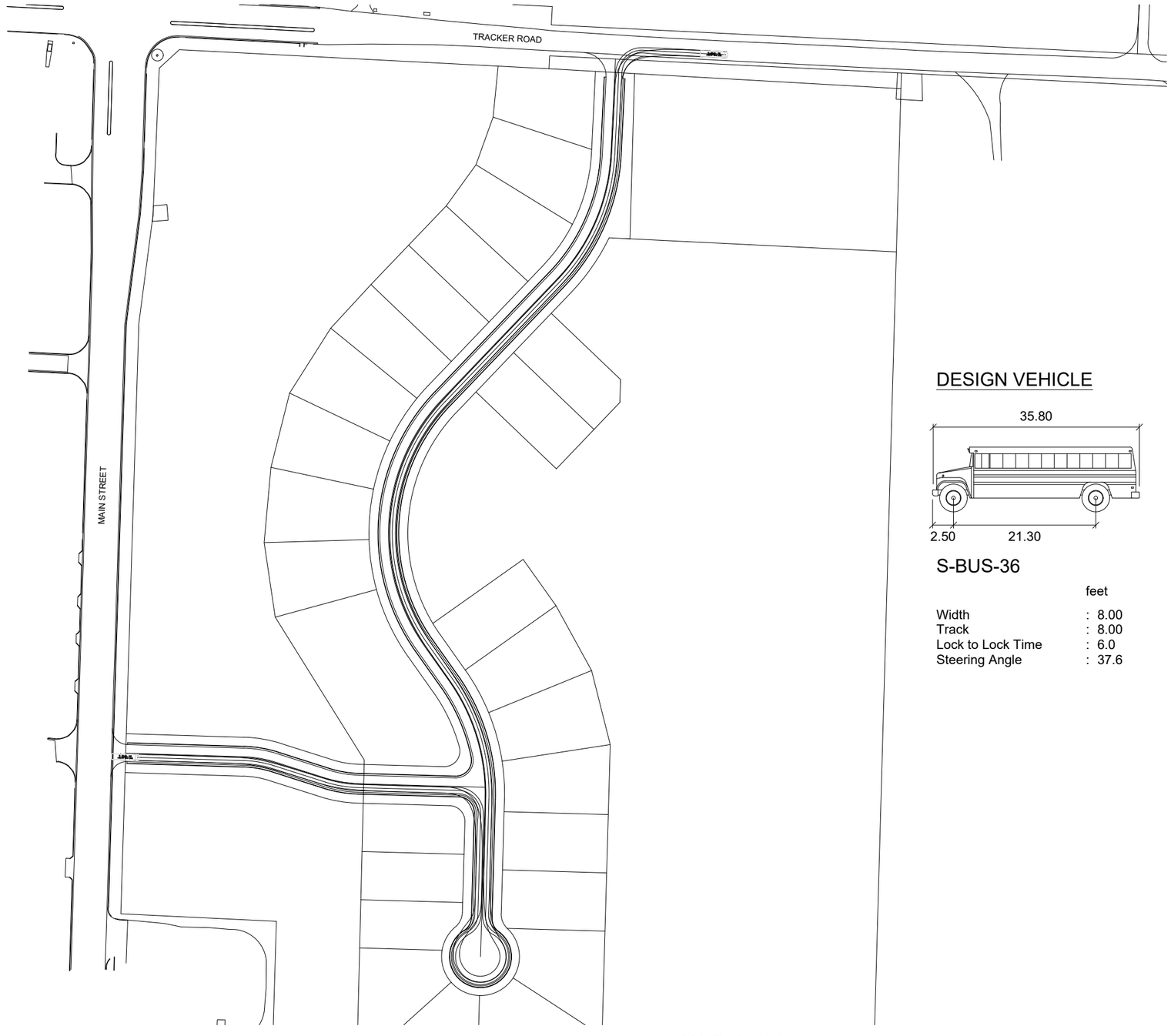
Copyright © 2021 by
Toth & Associates, Inc.

WALKER WOODS SUBDIVISION

EXHIBIT 3
AUTOTURN ANALYSIS

JOB NUMBER:	72-007CE
ISSUED DATE:	06/18/2021

TOTH & ASSOCIATES
1550 E. Republic Road, Springfield MO. 65804
Toth & Associates, Inc.
Missouri State Certificate of Authority #2004004242



DESIGN VEHICLE

S-BUS-36

		feet
Width	:	8.00
Track	:	8.00
Lock to Lock Time	:	6.0
Steering Angle	:	37.6

SCALE: 1" = 150'

N

Copyright © 2021 by
Toth & Associates, Inc.

WALKER ESTATES SUBDIVISION

EXHIBIT 4
AUTOTURN ANALYSIS

JOB NUMBER: 72-010CE
ISSUED DATE: 06/18/2021

TOTH & ASSOCIATES
1550 E. Republic Road, Springfield MO. 65804
Toth & Associates, Inc.
Missouri State Certificate of Authority #2004004242

KEY NOTES:

1. INSTALL TURN LANE IMPROVEMENTS.
2. PROPOSED INTERSECTION.

SCALE: 1" = 200'

N

Copyright © 2021 by
Toth & Associates, Inc.

TRACKER AND MAIN
NIXA, MISSOURI

EXHIBIT 5

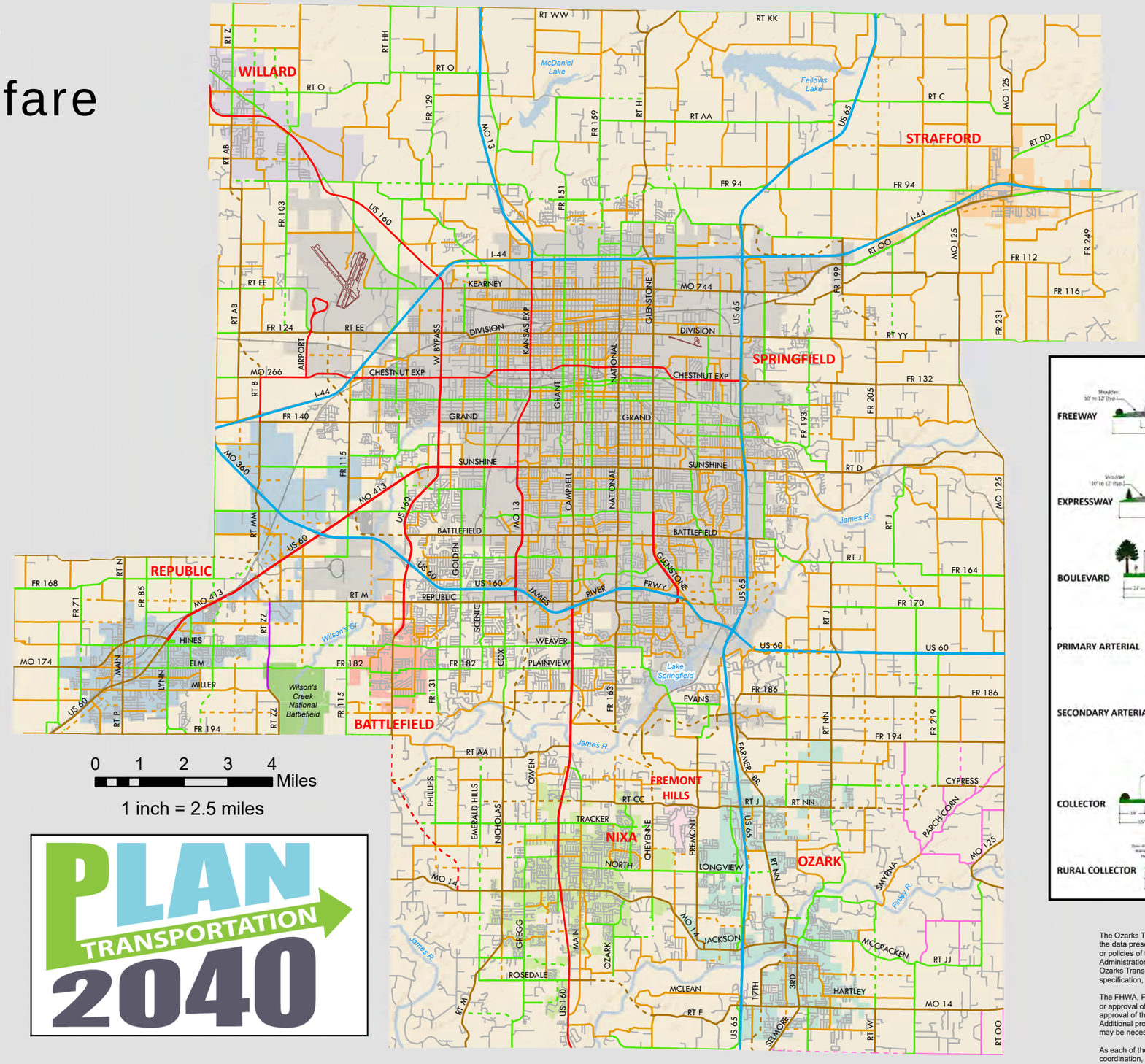
JOB NUMBER:	72.010
ISSUED DATE:	06/18/2021

TOTH & ASSOCIATES
1550 E. Republic Road, Springfield MO. 65804
Toth & Associates, Inc.
Missouri State Certificate of Authority #2004004242

EXHIBIT 6

Major Thoroughfare Plan

Map 8-1



0 1 2 3 4 Miles

1 inch = 2.5 miles

Legend

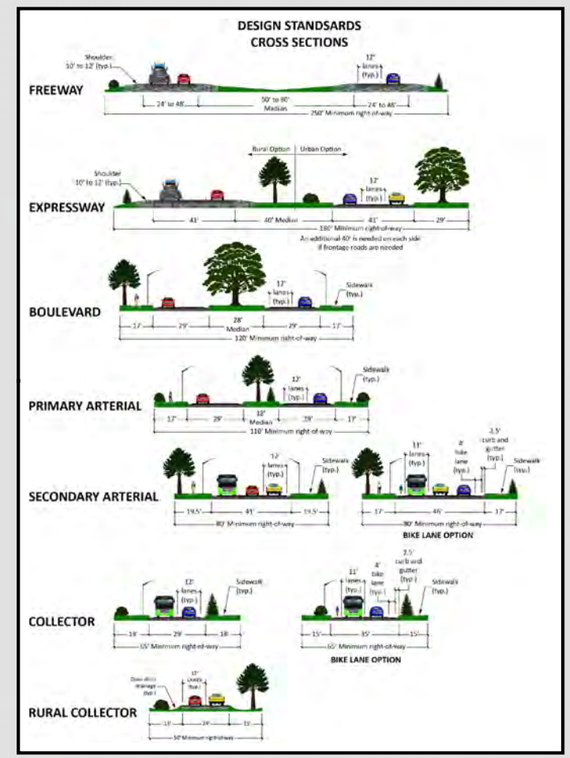
Existing Roads

- Freeway
- Expressway
- Primary Arterial
- Boulevard
- Secondary Arterial
- Collector
- Rural Collector
- Local
- Railroad

Proposed Roads

- Future Expressway
- Future Primary Arterial
- Future Secondary Arterial
- Future Collector
- Future Rural Collector
- Future Local Street

PLAN TRANSPORTATION 2040



DISCLAIMER

The Ozarks Transportation Organization is responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Missouri Department of Transportation (MoDOT), or the Ozarks Transportation Organization. This map does not constitute a standard, specification, or regulation.

The FHWA, FTA, OR MoDOT acceptance of this map does not constitute endorsement or approval of the need for any recommended improvements nor does it constitute approval of their location and design or a commitment to fund any such improvements. Additional project level environmental impact assessments and/or studies of alternatives may be necessary.

As each of the projects in the Major Thoroughfare Plan (MTP) is implemented, coordination, agreement, and independent approval of the participating local jurisdiction is required. No part of this MTP is to be interpreted as to diminish the authority of local jurisdictions in the area of land use and transportation.

APPENDIX A

COST ESTIMATE

TOTH & ASSOCIATES

Preliminary Opinion of Probable Construction Costs
Tracker and Main, Nixa, Missouri

TRACKER AND MAIN ROADWAY IMPROVEMENTS

Item	Description	Quantity	Units	Unit Price	Total Cost
1.00	**EARTHWORK**				
1.01	Clearing and Grubbing	1	LS	$5,000	$5,000
1.02	Sawcut and Removal of Existing Pavement	1	LS	$5,000	$5,000
1.03	Coldmilling Existing Pavement	350	SY	$3	$1,050
1.04	Site Grading - Cut (Unclassified)	750	CY	$10	$7,500
1.05	Site Grading - Fill	2,250	CY	$10	$22,500
1.06	Sediment and Erosion Control	1.0	LS	$7,500	$7,500
1.07	Seed, Fertilizer, and Mulch	1.0	AC	$5,000	$5,000
				SUBTOTAL	**$53,550**

Item	Description	Quantity	Units	Unit Price	Total Cost
2.00	**PAVING AND MISC.**				
2.01	6 in. Heavy Duty Asphalt Pavement	13,000	SF	$3.50	$45,500
2.02	8 in. Aggregate Base for Heavy Duty Asphalt	13,000	SF	$1.00	$13,000
2.03	Asphalt Pavement for Overlay (1.75" Thick)	32,000	SF	$1.25	$40,000
2.03	Pavement Markings	1	LS	$10,000	$10,000
2.04	Signage	1	LS	$5,000	$5,000
2.05	Traffic Control	1	LS	$10,000	$10,000
				SUBTOTAL	**$123,500**

Item	Description	Quantity	Units	Unit Price	Total Cost
3.00	**UTILITIES**				
3.01	Relocation of Existing Utilites	1	LS	$15,000	$15,000
					$15,000

CONSTRUCTION TOTALS

Construction Total	$192,050
Construction Contingency (20%)	$38,500
Mobilization, Demobilization, and Bonding (5%)	$11,528
Professional Services (23%)	$55,700
TOTAL	**$297,778**

NOTICE:
Opinion of Probable Construction Cost: The services, if any, of Engineer with respect to Opinion of Probable Construction Cost are to be made on the basis of Engineer's experience and qualifications and represent Engineer's best judgement as an experienced and qualified professional generally familiar with the construction industry. However, since Engineer has no control over the cost of labor, materials, equipment, or services furnished by others, or over contractor's methods of determining prices, or over competitive bidding or market conditions, Engineer cannot and does not guarantee that proposals, bids, or actual Construction Cost will not vary from Opinions of Probable Construction Cost prepared by Engineer.

APPENDIX B

COLLECTED TURNING MOVEMENT COUNT DATA

OBSERVER: LINCOLN DUNNING/DAN SHANNON DATE: 6.3.2021 COUNTY: CHRISTIAN CITY: NIXA
WEATHER: CLEAR 80° DAY: THURSDAY STATE: MO
INTERSECTION OF: TRACKER AND MAIN

15 Minute Time Period	MAIN ST from NORTH (SB)			MAIN ST from SOUTH (NB)			TRACKER RD from EAST (WB)			TRACKER RD from WEST (EB)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
4:00 PM - 4:15 PM	5	64	39	14	58	11	13	19	6	23 5 HEAVY VEHICLES	23	21
4:15 PM - 4:30 PM	4	66 1 HEAVY VEHICLE	42	7	65 1 HEAVY VEHICLE	9	13	21 1 HEAVY VEHICLE	9	14 1 HEAVY VEHICLE	28	24
4:30 PM - 4:45 PM	7	74 3 HEAVY VEHICLES	42	19	82 6 HEAVY VEHICLES	11 2 BICYCLES	13	27	6	28 2 HEAVY VEHICLES	25	30
4:45 PM - 5:00 PM	8	91	36	12	54 1 HEAVY VEHICLE	17	18	30 1 BICYCLE	9	23	42	20

OBSERVER: LINCOLN DUNNING/DAN SHANNON DATE: 6.3.2021 COUNTY: CHRISTIAN CITY: NIXA
WEATHER: CLEAR 80° DAY: THURSDAY STATE: MO
INTERSECTION OF: TRACKER AND MAIN

15 Minute Time Period	MAIN ST from NORTH (SB)			MAIN ST from SOUTH (NB)			TRACKER RD from EAST (WB)			TRACKER RD from WEST (EB)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
5:00 PM - 5:15 PM	6	83	35	22 3 HEAVY VEHICLES	64 1 HEAVY VEHICLE	19	14	40	9	29	30 1 HEAVY VEHICLE	23 1 BICYCLE
5:15 PM - 5:30 PM	6	91	52	14	66 1 HEAVY VEHICLE	11	8	26	8	21 2 HEAVY VEHICLES	24	26
5:30 PM - 5:45 PM	5	36	25	10	24	5	6	22	7	14 1 HEAVY VEHICLE	15	12
5:45 PM - 6:00 PM	5	23	27	3	11	2	4	11	6	7	8	10

OBSERVER: LINCOLN DUNNING/DAN SHANNON DATE: 6.4.2021 COUNTY: CHRISTIAN CITY: NIXA
WEATHER: CLEAR 65° DAY: FRIDAY STATE: MO
INTERSECTION OF: TRACKER AND MAIN

15 Minute Time Period	MAIN ST from NORTH (SB)			MAIN ST from SOUTH (NB)			TRACKER RD from EAST (WB)			TRACKER RD from WEST (EB)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
7:00 AM - 7:15 AM	1	25	36 1 HEAVY VEHICLE	27 5 HEAVY VEHICLES	56 1 HEAVY VEHICLE	4	7	36	10	22 1 HEAVY VEHICLE	18	22 7 HEAVY VEHICLES
7:15 AM - 7:30 AM	1	32 1 HEAVY VEHICLE	26	29	89	10	5	27	5	28 3 HEAVY VEHICLES	20	14 1 HEAVY VEHICLE
7:30 AM - 7:45 AM	0	33 3 HEAVY VEHICLES	14	18 1 HEAVY VEHICLE	90 3 HEAVY VEHICLES	4	7	33	12	41 2 HEAVY VEHICLES	12 1 HEAVY VEHICLE	3
7:45 AM - 8:00 AM	5	67	27 5 HEAVY VEHICLES	11	47 1 HEAVY VEHICLE	6	11	26	13	21	12	3

OBSERVER: LINCOLN DUNNING/DAN SHANNON DATE: 6.4.2021 COUNTY: CHRISTIAN CITY: NIXA
WEATHER: CLEAR 65° DAY: FRIDAY STATE: MO
INTERSECTION OF: TRACKER AND MAIN

15 Minute Time Period	MAIN ST from NORTH (SB)			MAIN ST from SOUTH (NB)			TRACKER RD from EAST (WB)			TRACKER RD from WEST (EB)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
8:00 AM - 8:15 AM	2	34 1 HEAVY VEHICLE	27	12	54 2 HEAVY VEHICLES	11	5	17	22	28	16	11 1 HEAVY VEHICLE
8:15 AM - 8:30 AM	3	33 1 HEAVY VEHICLE	24 2 HEAVY VEHICLES	8 1 HEAVY VEHICLE	35 1 HEAVY VEHICLE	3	9	27 1 HEAVY VEHICLE	16	31 2 HEAVY VEHICLES	9	7 1 HEAVY VEHICLE
8:30 AM - 8:45 AM	2	34 1 HEAVY VEHICLE	18	13 1 HEAVY VEHICLE	54 1 HEAVY VEHICLE	8	7	16	11	18	8	7 2 HEAVY VEHICLES
8:45 AM - 9:00 AM	2	45	25	13	39 1 HEAVY VEHICLE	2	14	13	13	27 3 HEAVY VEHICLES	9	12

APPENDIX C

CAPACITY CALCULATIONS

CAPACITY CALCULATIONS

Intersection Info: **Tracker Road and Donald St. - 2023 Build Scenario - AM Peak Hour**

CONVERT MOVEMENT DEMAND VOLUMES TO FLOW RATES

MOVEMENT			SBR	SBT	SBL	WBR	WBT	WBL	WBU	NBR	NBT	NBL	EBR	EBT	EBL	EBU
TRAFFIC VOLUME		veh/hr	10	0	5	3	200	0	0	0	0	0	0	97	2	0
GRADES	G	integer %	1	1	1	-3	-3	-3	-3	1	1	1	3	3	3	3
PHF			92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%
% HEAVY		integer %	0	0	0	0	8	0	0	0	0	0	0	0	0	0
MVMT FLOW	v_i	veh/hr	11	0	5	3	217	0	0	0	0	0	0	105	2	0

CONFLICTING FLOW RATES, $V_{c,x}$

MOVEMENTS	**12**	**11**	**10**	**-**	**-**	**4**	**4U**	**9**	**8**	**7**	**-**	**-**	**1**	**1U**
CONFLICTING FLOW ALL	110	328	275	-	-	105	105	53	329	218	-	-	220	220

CRITICAL HEADWAY, $t_{c,x}$

Base Crit HW	t_{cbase}	6.90	-	-	-	-	4.10	6.40	6.90	-	-	-	-	4.10	6.40
Adj for HV	$t_{c,HV}$	2.00	2.00	2.00	-	-	2.00	2.00	2.00	2.00	2.00	-	-	2.00	2.00
Prop. Of HV	P_{HV}	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Adj for Grade	$t_{c,G}$	0.10	0.20	0.20	-	-	-	-	0.10	0.20	0.20	-	-	-	-
Grades	G	1.00	1.00	1.00	-3.00	-3.00	-3.00	-3.00	1.00	1.00	1.00	3.00	3.00	3.00	3.00
Adj. for Int. Geom	$t_{3,LT}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Headway		7.00	-	-	-	-	4.10	6.40	7.00	-	-	-	-	4.10	6.40

FOLLOW UP HEADWAY, $t_{f,x}$																
Base Follow up HW	t_{fbase}	3.30	4.00	3.50	-	-	2.20	2.50	3.30	4.00	3.50	-	-	2.20	2.50
Adj for HV	$t_{f,HV}$	1.00	1.00	1.00	-	-	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00
Prop. Of HV	P_{HV}	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Follow up Headway	$t_{f,x}$	3.30	4.00	3.50	-	-	2.20	2.50	3.30	4.00	3.50	-	-	2.20	2.50

POTENTIAL CAPACITY, $c_{p,x}$															
Potential Cap - 1 Maneuver	926	639	703	-	-	1,499	1,239	1,009	638	761	-	-	1,361	1,050

COMPUTE MOVEMENT CAPACITIES, $C_{m,j}$																
MOVEMENTS			**12**	**11**	**10**	**-**	**-**	**4**	**4U**	**9**	**8**	**7**	**-**	**-**	**1**	**1U**
Compute Rank 1 Mov Cap's																
Compute Rank 2 Mov Cap's		Step 7a						1,499							1,361	
		Step 7b	926							1,009						
		Step 7c							1,239							1,038
Compute f_{1U}	0.98812															
Comput f_{4U}	1.00000															
		Step 7d														
Use Eqn 20-42 as the LT and T lanes are not shared.																
Compute $p_{0,j}$	j = 1 or 4															
$p_{0,1}$	0.99853		$p_{0,1U}$	1.00000												
$p_{0,4}$	1.00000		$p_{0,4U}$	1.00000												
Compute Rank 3 Mov Cap's		Step 8a														
Rank 3 One Stage Movement																
f_k	0.99853		(capacity adjustment factor)													
Compute $c_{m,k}$																
Movement Cap - 2 Maneuver				638							637					
	STAGE 1			716							803					
	STAGE 2			803							715					
Rank 3 Two Stage Movement																
Compute adj factors a and y		Step 8b														
nm	2.00															
a	0.94910															
C_{II}	Red															
v_L (1 and 1U)	2															
v_L (4 and 4U)	0															
Select max v_L	2															
y				0.47868							2.18713					
Compute Total Cap, C_T (Cap 2 Maneuver)				670							668					

Compute Rank 4 Mov Cap's		Step 9a		
$p_{0,8}$	1.00000			
$p_{0,11}$	1.00000			
For Rank 4, Mvmt 7, p'' =		0.99853		
From eqn 20-52, p' =		0.99888		
For Rank 4, Mvmt 10, p'' =		0.99853		
From eqn 20-52, p' =		0.99888		
$p_{0,9}$	1.00000			
$p_{0,12}$	0.98812			
$f_{p,l}$			0.98701	0.99888
Compute $c_{m,l}$				
Movement Cap - 2 Maneuver			694	760
nm	2.00			
a	0.94910			
C_{ll}	Red			
v_L (1 and 1U)	2			
v_L (4 and 4U)	0			
Select max v_L	2			
γ			0.23326	1.01136
Compute Total Cap, C_T (Cap 2 Maneuver)			710	799

COMPUTE MOVEMENT CONTROL DELAY

Step 11a

Compute CD for Rank 2 - Rank 4 Movements

MOVEMENTS			**12**	**11**	**10**	-	-	**4**	**4U**	**9**	**8**	**7**	-	-	**1**	**1U**
$C_{m,x}$	(veh/hr)	T	926	670	710			1,499	1,239	1,009	668	799			1,361	1,038
d = Control delay (sec/veh)	h	0.25	8.9	10.4	10.1			7.4	7.9	8.6	10.4	9.5			7.6	8.5
v/c Ratio			0.01	0.00	0.01			0.00	0.00	0.00	0.00	0.00			0.00	0.00
HCM LOS			A	B	B			A	A	A	B	A			A	A

COMPUTE APPROACH CONTROL DELAY

d_A (southbound)	9.26	s/veh	d_A (northbound)	#DIV/0!	s/veh
HCM LOS	A		HCM LOS	#DIV/0!	

COMPUTE 95TH PERCENTILE QUEUE LENGTHS

	T											
	0.25											
Q_{95}		0.03605	0.00000	0.02128	0.00000	0.00000	0.00000	0.00000	0.00000	0.00441	0.00000

CAPACITY CALCULATIONS

Intersection Info: **Tracker Road and Donald St. - 2023 Build Scenario - PM Peak Hour**

CONVERT MOVEMENT DEMAND VOLUMES TO FLOW RATES

MOVEMENT			SBR	SBT	SBL	WBR	WBT	WBL	WBU	NBR	NBT	NBL	EBR	EBT	EBL	EBU
TRAFFIC VOLUME		veh/hr	5	0	5	14	216	0	0	0	0	0	0	214	13	0
GRADES	G	integer %	1	1	1	-3	-3	-3	-3	1	1	1	3	3	3	3
PHF			92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%
% HEAVY		integer %	0	0	0	0	0	0	0	0	0	0	0	1	0	0
MVMT FLOW	v_i	veh/hr	5	0	5	15	235	0	0	0	0	0	0	233	14	0

CONFLICTING FLOW RATES, $V_{c,x}$

MOVEMENTS	**12**	**11**	**10**	**-**	**-**	**4**	**4U**	**9**	**8**	**7**	**-**	**-**	**1**	**1U**
CONFLICTING FLOW ALL	125	504	387	-	-	233	233	117	511	379	-	-	250	250

CRITICAL HEADWAY, $t_{c,x}$

Base Crit HW	t_{cbase}	6.90	-	-	-	-	4.10	6.40	6.90	-	-	-	-	4.10	6.40
Adj for HV	$t_{c,HV}$	2.00	2.00	2.00	-	-	2.00	2.00	2.00	2.00	2.00	-	-	2.00	2.00
Prop. Of HV	P_{HV}	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Adj for Grade	$t_{c,G}$	0.10	0.20	0.20	-	-	-	-	0.10	0.20	0.20	-	-	-	-
Grades	G	1.00	1.00	1.00	-3.00	-3.00	-3.00	-3.00	1.00	1.00	1.00	3.00	3.00	3.00	3.00
Adj. for Int. Geom	$t_{3,LT}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Headway		7.00	-	-	-	-	4.10	6.40	7.00	-	-	-	-	4.10	6.40

FOLLOW UP HEADWAY, $t_{f,x}$																
Base Follow up HW	t_{fbase}	3.30	4.00	3.50	-	-	2.20	2.50	3.30	4.00	3.50	-	-	2.20	2.50
Adj for HV	$t_{f,HV}$	1.00	1.00	1.00	-	-	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00
Prop. Of HV	P_{HV}	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Follow up Headway	$t_{f,x}$	3.30	4.00	3.50	-	-	2.20	2.50	3.30	4.00	3.50	-	-	2.20	2.50

POTENTIAL CAPACITY, $c_{p,x}$															
Potential Cap - 1 Maneuver		905	529	601	-	-	1,346	1,031	917	525	608	-	-	1,327	1,006

COMPUTE MOVEMENT CAPACITIES, $C_{m,j}$																
MOVEMENTS			**12**	**11**	**10**	**-**	**-**	**4**	**4U**	**9**	**8**	**7**	**-**	**-**	**1**	**1U**
Compute Rank 1 Mov Cap's																
Compute Rank 2 Mov Cap's		Step 7a						1,346							1,327	
		Step 7b	905							917						
		Step 7c							1,031							1,000
Compute f_{1U}	0.99448															
Comput f_{4U}	1.00000															
		Step 7d														
Use Eqn 20-42 as the LT and T lanes are not shared.																
Compute $p_{0,j}$	j = 1 or 4															
$p_{0,1}$	0.98945		$p_{0,1U}$	1.00000												
$p_{0,4}$	1.00000		$p_{0,4U}$	1.00000												
Compute Rank 3 Mov Cap's		Step 8a														
Rank 3 One Stage Movement																
f_k	0.98945		(capacity adjustment factor)													
Compute $c_{m,k}$																
Movement Cap - 2 Maneuver				524							520					
	STAGE 1			692							679					
	STAGE 2			679							687					
Rank 3 Two Stage Movement																
Compute adj factors a and y		Step 8b														
nm	2.00															
a	0.94910															
C_{II}	Red															
v_L (1 and 1U)	14															
v_L (4 and 4U)	0															
Select max v_L	14															
y				1.19443							1.03982					
Compute Total Cap, C_T (Cap 2 Maneuver)				594							592					

Compute Rank 4 Mov Cap's		Step 9a		
$p_{0,8}$	1.00000			
$p_{0,11}$	1.00000			
For Rank 4, Mvmt 7, p'' =		0.98945		
From eqn 20-52, p' =		0.99195		
For Rank 4, Mvmt 10, p'' =		0.98945		
From eqn 20-52, p' =		0.99195		
$p_{0,9}$	1.00000			
$p_{0,12}$	0.99448			
$f_{p,l}$			0.98648	0.99195
Compute $c_{m,l}$				
Movement Cap - 2 Maneuver			592	603
nm	2.00			
a	0.94910			
C_{ll}	Red			
v_L (1 and 1U)	14			
v_L (4 and 4U)	0			
Select max v_L	14			
γ			0.59114	0.43006
Compute Total Cap, C_T (Cap 2 Maneuver)			666	663

COMPUTE MOVEMENT CONTROL DELAY

Step 11a

Compute CD for Rank 2 - Rank 4 Movements

MOVEMENTS			**12**	**11**	**10**	-	-	**4**	**4U**	**9**	**8**	**7**	-	-	**1**	**1U**
$C_{m,x}$	(veh/hr)	T	905	594	666			1,346	1,031	917	592	663			1,327	1,000
d = Control delay (sec/veh)	h	0.25	9.0	11.1	10.4			7.7	8.5	8.9	11.1	10.4			7.7	8.6
v/c Ratio			0.01	0.00	0.01			0.00	0.00	0.00	0.00	0.00			0.01	0.00
HCM LOS			A	B	B			A	A	A	B	B			A	A

COMPUTE APPROACH CONTROL DELAY

d_A (southbound)	9.69	s/veh	d_A (northbound)	#DIV/0!	s/veh
HCM LOS	A		HCM LOS	#DIV/0!	

COMPUTE 95TH PERCENTILE QUEUE LENGTHS

	T												
	0.25												
Q_{95}		0.01666	0.00000	0.02270			0.00000	0.00000	0.00000	0.00000	0.00000		0.03197	0.00000

CAPACITY CALCULATIONS

Intersection Info: **Tracker Road and Donald St. - 2043 Build Scenario - AM Peak Hour**

CONVERT MOVEMENT DEMAND VOLUMES TO FLOW RATES

MOVEMENT			SBR	SBT	SBL	WBR	WBT	WBL	WBU	NBR	NBT	NBL	EBR	EBT	EBL	EBU
TRAFFIC VOLUME		veh/hr	10	0	5	3	297	0	0	0	0	0	0	144	2	0
GRADES	G	integer %	1	1	1	-3	-3	-3	-3	1	1	1	3	4	3	3
PHF			92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%
% HEAVY		integer %	0	0	0	0	8	0	0	0	0	0	0	0	0	0
MVMT FLOW	v_i	veh/hr	11	0	5	3	323	0	0	0	0	0	0	157	2	0

CONFLICTING FLOW RATES, $V_{c,x}$

MOVEMENTS	**12**	**11**	**10**	**-**	**-**	**4**	**4U**	**9**	**8**	**7**	**-**	**-**	**1**	**1U**
CONFLICTING FLOW ALL	163	486	407	-	-	157	157	79	487	323	-	-	326	326

CRITICAL HEADWAY, $t_{c,x}$

Base Crit HW	t_{cbase}	6.90	-	-	-	-	4.10	6.40	6.90	-	-	-	-	4.10	6.40
Adj for HV	$t_{c,HV}$	2.00	2.00	2.00	-	-	2.00	2.00	2.00	2.00	2.00	-	-	2.00	2.00
Prop. Of HV	P_{HV}	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Adj for Grade	$t_{c,G}$	0.10	0.20	0.20	-	-	-	-	0.10	0.20	0.20	-	-	-	-
Grades	G	1.00	1.00	1.00	-3.00	-3.00	-3.00	-3.00	1.00	1.00	1.00	3.00	4.00	3.00	3.00
Adj. for Int. Geom	$t_{3,LT}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Headway		7.00	-	-	-	-	4.10	6.40	7.00	-	-	-	-	4.10	6.40

FOLLOW UP HEADWAY, $t_{f,x}$																
Base Follow up HW	t_{fbase}	3.30	4.00	3.50	-	-	2.20	2.50	3.30	4.00	3.50	-	-	2.20	2.50
Adj for HV	$t_{f,HV}$	1.00	1.00	1.00	-	-	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00
Prop. Of HV	P_{HV}	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Follow up Headway	$t_{f,x}$	3.30	4.00	3.50	-	-	2.20	2.50	3.30	4.00	3.50	-	-	2.20	2.50

POTENTIAL CAPACITY, $c_{p,x}$															
Potential Cap - 1 Maneuver	855	540	584	-	-	1,435	1,150	971	539	657	-	-	1,245	901

COMPUTE MOVEMENT CAPACITIES, $C_{m,j}$																
MOVEMENTS			**12**	**11**	**10**	**-**	**-**	**4**	**4U**	**9**	**8**	**7**	**-**	**-**	**1**	**1U**
Compute Rank 1 Mov Cap's																
Compute Rank 2 Mov Cap's		Step 7a						1,435							1,245	
		Step 7b	855							971						
		Step 7c							1,150							890
Compute f_{1U}	0.98714															
Comput f_{4U}	1.00000															
		Step 7d														
Use Eqn 20-42 as the LT and T lanes are not shared.																
Compute $p_{0,j}$	j = 1 or 4															
$p_{0,1}$	0.99839		$p_{0,1U}$	1.00000												
$p_{0,4}$	1.00000		$p_{0,4U}$	1.00000												
Compute Rank 3 Mov Cap's		Step 8a														
Rank 3 One Stage Movement																
f_k	0.99839		(capacity adjustment factor)													
Compute $c_{m,k}$																
Movement Cap - 2 Maneuver				539							538					
	STAGE 1			640							761					
	STAGE 2			761							639					
Rank 3 Two Stage Movement																
Compute adj factors a and y		Step 8b														
nm	2.00															
a	0.94910															
C_{II}	Red															
v_L (1 and 1U)	2															
v_L (4 and 4U)	0															
Select max v_L	2															
y				0.46129							2.24377					
Compute Total Cap, C_T (Cap 2 Maneuver)				595							593					

Compute Rank 4 Mov Cap's		Step 9a		
$p_{0,8}$	1.00000			
$p_{0,11}$	1.00000			
For Rank 4, Mvmt 7, p'' =		0.99839		
From eqn 20-52, p' =		0.99878		
For Rank 4, Mvmt 10, p'' =		0.99839		
From eqn 20-52, p' =		0.99878		
$p_{0,9}$	1.00000			
$p_{0,12}$	0.98714			
$f_{p,l}$			0.98593	0.99878
Compute $c_{m,l}$				
Movement Cap - 2 Maneuver			576	657
nm	2.00			
a	0.94910			
C_{ll}	Red			
v_L (1 and 1U)	2			
v_L (4 and 4U)	0			
Select max v_L	2			
γ			0.21591	1.01575
Compute Total Cap, C_T (Cap 2 Maneuver)			611	727

COMPUTE MOVEMENT CONTROL DELAY

Step 11a

Compute CD for Rank 2 - Rank 4 Movements

MOVEMENTS			**12**	**11**	**10**	-	-	**4**	**4U**	**9**	**8**	**7**	-	-	**1**	**1U**
$C_{m,x}$	(veh/hr)	T	855	595	611			1,435	1,150	971	593	727			1,245	890
d = Control delay (sec/veh)	h	0.25	9.2	11.0	10.9			7.5	8.1	8.7	11.1	9.9			7.9	9.0
v/c Ratio			0.01	0.00	0.01			0.00	0.00	0.00	0.00	0.00			0.00	0.00
HCM LOS			A	B	B			A	A	A	B	A			A	A

COMPUTE APPROACH CONTROL DELAY

d_A (southbound)	9.74	s/veh	d_A (northbound)	#DIV/0!	s/veh
HCM LOS	A		HCM LOS	#DIV/0!	

COMPUTE 95TH PERCENTILE QUEUE LENGTHS

	T											
	0.25											
Q_{95}		0.03907	0.00000	0.02474	0.00000	0.00000	0.00000	0.00000	0.00000	0.00483	0.00000

CAPACITY CALCULATIONS

Intersection Info: **Tracker Road and Donald St. - 2043 Build Scenario - PM Peak Hour**

CONVERT MOVEMENT DEMAND VOLUMES TO FLOW RATES

MOVEMENT			SBR	SBT	SBL	WBR	WBT	WBL	WBU	NBR	NBT	NBL	EBR	EBT	EBL	EBU
TRAFFIC VOLUME		veh/hr	5	0	5	14	321	0	0	0	0	0	0	319	13	0
GRADES	G	integer %	1	1	1	-3	-3	-3	-3	1	1	1	3	3	3	3
PHF			92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%
% HEAVY		integer %	0	0	0	0	0	0	0	0	0	0	0	1	0	0
MVMT FLOW	v_i	veh/hr	5	0	5	15	349	0	0	0	0	0	0	347	14	0

CONFLICTING FLOW RATES, $V_{c,x}$

MOVEMENTS	**12**	**11**	**10**	**-**	**-**	**4**	**4U**	**9**	**8**	**7**	**-**	**-**	**1**	**1U**
CONFLICTING FLOW ALL	182	732	558	-	-	347	347	174	739	550	-	-	364	364

CRITICAL HEADWAY, $t_{c,x}$

Base Crit HW	t_{cbase}	6.90	-	-	-	-	4.10	6.40	6.90	-	-	-	-	4.10	6.40
Adj for HV	$t_{c,HV}$	2.00	2.00	2.00	-	-	2.00	2.00	2.00	2.00	2.00	-	-	2.00	2.00
Prop. Of HV	P_{HV}	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Adj for Grade	$t_{c,G}$	0.10	0.20	0.20	-	-	-	-	0.10	0.20	0.20	-	-	-	-
Grades	G	1.00	1.00	1.00	-3.00	-3.00	-3.00	-3.00	1.00	1.00	1.00	3.00	3.00	3.00	3.00
Adj. for Int. Geom	$t_{3,LT}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Headway		7.00	-	-	-	-	4.10	6.40	7.00	-	-	-	-	4.10	6.40

FOLLOW UP HEADWAY, $t_{f,x}$																
Base Follow up HW	t_{fbase}	3.30	4.00	3.50	-	-	2.20	2.50	3.30	4.00	3.50	-	-	2.20	2.50
Adj for HV	$t_{f,HV}$	1.00	1.00	1.00	-	-	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00
Prop. Of HV	P_{HV}	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Follow up Headway	$t_{f,x}$	3.30	4.00	3.50	-	-	2.20	2.50	3.30	4.00	3.50	-	-	2.20	2.50

POTENTIAL CAPACITY, $c_{p,x}$															
Potential Cap - 1 Maneuver		831	413	472	-	-	1,223	874	842	409	477	-	-	1,206	853

COMPUTE MOVEMENT CAPACITIES, $C_{m,j}$																
MOVEMENTS			**12**	**11**	**10**	**-**	**-**	**4**	**4U**	**9**	**8**	**7**	**-**	**-**	**1**	**1U**
Compute Rank 1 Mov Cap's																
Compute Rank 2 Mov Cap's		Step 7a						1,223							1,206	
		Step 7b	831							842						
		Step 7c							874							848
Compute f_{1U}	0.99399															
Comput f_{4U}	1.00000															
		Step 7d														
Use Eqn 20-42 as the LT and T lanes are not shared.																
Compute $p_{0,j}$	j = 1 or 4															
$p_{0,1}$	0.98839		$p_{0,1U}$	1.00000												
$p_{0,4}$	1.00000		$p_{0,4U}$	1.00000												
Compute Rank 3 Mov Cap's		Step 8a														
Rank 3 One Stage Movement																
f_k	0.98839		(capacity adjustment factor)													
Compute $c_{m,k}$																
Movement Cap - 2 Maneuver				408							405					
	STAGE 1			613							601					
	STAGE 2			601							608					
Rank 3 Two Stage Movement																
Compute adj factors a and y		Step 8b														
nm	2.00															
a	0.94910															
C_{II}	Red															
v_L (1 and 1U)	14															
v_L (4 and 4U)	0															
Select max v_L	14															
y				1.14534							1.03659					
Compute Total Cap, C_T (Cap 2 Maneuver)				508							506					

Compute Rank 4 Mov Cap's		Step 9a		
$p_{0,8}$	1.00000			
$p_{0,11}$	1.00000			
For Rank 4, Mvmt 7, p'' =		0.98839		
From eqn 20-52, p' =		0.99114		
For Rank 4, Mvmt 10, p'' =		0.98839		
From eqn 20-52, p' =		0.99114		
$p_{0,9}$	1.00000			
$p_{0,12}$	0.99399			
$f_{p,l}$			0.98518	0.99114
Compute $c_{m,l}$				
Movement Cap - 2 Maneuver			465	473
nm	2.00			
a	0.94910			
C_{ll}	Red			
v_L (1 and 1U)	14			
v_L (4 and 4U)	0			
Select max v_L	14			
γ			0.53040	0.42115
Compute Total Cap, C_T (Cap 2 Maneuver)			564	561

COMPUTE MOVEMENT CONTROL DELAY

Step 11a

Compute CD for Rank 2 - Rank 4 Movements

MOVEMENTS			**12**	**11**	**10**	-	-	**4**	**4U**	**9**	**8**	**7**	-	-	**1**	**1U**
$C_{m,x}$	(veh/hr)	T	831	508	564			1,223	874	842	506	561			1,206	848
d = Control delay (sec/veh)	h	0.25	9.3	12.1	11.4			7.9	9.1	9.3	12.1	11.4			8.0	9.2
v/c Ratio			0.01	0.00	0.01			0.00	0.00	0.00	0.00	0.00			0.01	0.00
HCM LOS			A	B	B			A	A	A	B	B			A	A

COMPUTE APPROACH CONTROL DELAY

d_A (southbound)	10.36	s/veh	d_A (northbound)	#DIV/0!	s/veh
HCM LOS	B		HCM LOS	#DIV/0!	

COMPUTE 95TH PERCENTILE QUEUE LENGTHS

	T												
	0.25												
Q_{95}		0.01815	0.00000	0.02684			0.00000	0.00000	0.00000	0.00000	0.00000		0.03523	0.00000

CAPACITY CALCULATIONS

Intersection Info: **Tracker Road and Maxine Ave. - 2023 Build Scenario - AM Peak Hour**

CONVERT MOVEMENT DEMAND VOLUMES TO FLOW RATES

MOVEMENT			SBR	SBT	SBL	WBR	WBT	WBL	WBU	NBR	NBT	NBL	EBR	EBT	EBL	EBU
TRAFFIC VOLUME		veh/hr	0	0	0	0	200	16	0	3	0	8	8	97	0	0
GRADES	G	integer %	1	1	1	-4	-4	-4	-4	1	1	1	4	4	4	4
PHF			92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%
% HEAVY		integer %	0	0	0	0	8	0	0	0	0	0	0	0	0	0
MVMT FLOW	v_i	veh/hr	0	0	0	0	217	17	0	3	0	9	9	105	0	0

CONFLICTING FLOW RATES, $V_{c,x}$

MOVEMENTS	**12**	**11**	**10**	**-**	**-**	**4**	**4U**	**9**	**8**	**7**	**-**	**-**	**1**	**1U**
CONFLICTING FLOW ALL	109	365	304	-	-	114	114	57	361	252	-	-	217	217

CRITICAL HEADWAY, $t_{c,x}$

Base Crit HW	t_{cbase}	6.90	-	-	-	-	4.10	6.40	6.90	-	-	-	-	4.10	6.40
Adj for HV	$t_{c,HV}$	2.00	2.00	2.00	-	-	2.00	2.00	2.00	2.00	2.00	-	-	2.00	2.00
Prop. Of HV	P_{HV}	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Adj for Grade	$t_{c,G}$	0.10	0.20	0.20	-	-	-	-	0.10	0.20	0.20	-	-	-	-
Grades	G	1.00	1.00	1.00	-4.00	-4.00	-4.00	-4.00	1.00	1.00	1.00	4.00	4.00	4.00	4.00
Adj. for Int. Geom	$t_{3,LT}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Headway		7.00	-	-	-	-	4.10	6.40	7.00	-	-	-	-	4.10	6.40

FOLLOW UP HEADWAY, $t_{f,x}$																
Base Follow up HW	t_{fbase}	3.30	4.00	3.50	-	-	2.20	2.50	3.30	4.00	3.50	-	-	2.20	2.50
Adj for HV	$t_{f,HV}$	1.00	1.00	1.00	-	-	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00
Prop. Of HV	P_{HV}	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Follow up Headway	$t_{f,x}$	3.30	4.00	3.50	-	-	2.20	2.50	3.30	4.00	3.50	-	-	2.20	2.50

POTENTIAL CAPACITY, $c_{p,x}$															
Potential Cap - 1 Maneuver	928	614	675	-	-	1,488	1,223	1,002	617	726	-	-	1,365	1,055

COMPUTE MOVEMENT CAPACITIES, $C_{m,j}$																
MOVEMENTS			**12**	**11**	**10**	**-**	**-**	**4**	**4U**	**9**	**8**	**7**	**-**	**-**	**1**	**1U**
Compute Rank 1 Mov Cap's																
Compute Rank 2 Mov Cap's		Step 7a						1,488							1,365	
		Step 7b	928							1,002						
		Step 7c							1,219							1,055
Compute f_{1U}	1.00000															
Comput f_{4U}	0.99701															
		Step 7d														
Use Eqn 20-42 as the LT and T lanes are not shared.																
Compute $p_{0,j}$	j = 1 or 4															
$p_{0,1}$	1.00000		$p_{0,1U}$	1.00000												
$p_{0,4}$	0.98857		$p_{0,4U}$	1.00000												
Compute Rank 3 Mov Cap's		Step 8a														
Rank 3 One Stage Movement																
f_k	0.98857		(capacity adjustment factor)													
Compute $c_{m,k}$																
Movement Cap - 2 Maneuver				607							610					
	STAGE 1			685							795					
	STAGE 2			791							685					
Rank 3 Two Stage Movement																
Compute adj factors a and y		Step 8b														
nm	2.00															
a	0.94910															
C_{II}	Red															
v_L (1 and 1U)	0															
v_L (4 and 4U)	17															
Select max v_L	17															
y				0.46794							3.17703					
Compute Total Cap, C_T (Cap 2 Maneuver)				641							630					

Compute Rank 4 Mov Cap's		Step 9a		
$p_{0,8}$	1.00000			
$p_{0,11}$	1.00000			
For Rank 4, Mvmt 7, p'' =		0.98857		
From eqn 20-52, p' =		0.99128		
For Rank 4, Mvmt 10, p'' =		0.98857		
From eqn 20-52, p' =		0.99128		
$p_{0,9}$	0.99701			
$p_{0,12}$	1.00000			
$f_{p,l}$			0.99128	0.98832
Compute $c_{m,l}$				
Movement Cap - 2 Maneuver			669	717
nm	2.00			
a	0.94910			
C_{ll}	Red			
v_L (1 and 1U)	0			
v_L (4 and 4U)	17			
Select max v_L	17			
γ			0.19423	1.55529
Compute Total Cap, C_T (Cap 2 Maneuver)			682	757

COMPUTE MOVEMENT CONTROL DELAY

Step 11a

Compute CD for Rank 2 - Rank 4 Movements

MOVEMENTS			**12**	**11**	**10**	-	-	**4**	**4U**	**9**	**8**	**7**	-	-	**1**	**1U**
$C_{m,x}$	(veh/hr)	T	928	641	682			1,488	1,219	1,002	630	757			1,365	1,055
d = Control delay (sec/veh)	h	0.25	8.9	10.6	10.3			7.4	8.0	8.6	10.7	9.8			7.6	8.4
v/c Ratio			0.00	0.00	0.00			0.01	0.00	0.00	0.00	0.01			0.00	0.00
HCM LOS			A	B	B			A	A	A	B	A			A	A

COMPUTE APPROACH CONTROL DELAY

d_A (southbound)	#DIV/0!	s/veh	d_A (northbound)	9.47	s/veh
HCM LOS	#DIV/0!		HCM LOS	A	

COMPUTE 95TH PERCENTILE QUEUE LENGTHS

	T											
	0.25											
Q_{95}		0.00000	0.00000	0.00000			0.03467	0.00000	0.00901	0.00000	0.03608			0.00000	0.00000

CAPACITY CALCULATIONS

Intersection Info: **Tracker Road and Maxine Ave. - 2023 Build Scenario - PM Peak Hour**

CONVERT MOVEMENT DEMAND VOLUMES TO FLOW RATES

MOVEMENT			SBR	SBT	SBL	WBR	WBT	WBL	WBU	NBR	NBT	NBL	EBR	EBT	EBL	EBU
TRAFFIC VOLUME		veh/hr	0	0	0	0	216	7	0	10	0	11	7	214	0	0
GRADES	G	integer %	1	1	1	-4	-4	-4	-4	1	1	1	4	4	4	4
PHF			92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%
% HEAVY		integer %	0	0	0	0	0	0	0	0	0	0	0	1	0	0
MVMT FLOW	v_i	veh/hr	0	0	0	0	235	8	0	11	0	12	8	233	0	0

CONFLICTING FLOW RATES, $V_{c,x}$

MOVEMENTS	**12**	**11**	**10**	**-**	**-**	**4**	**4U**	**9**	**8**	**7**	**-**	**-**	**1**	**1U**
CONFLICTING FLOW ALL	118	492	368	-	-	241	241	121	488	371	-	-	235	235

CRITICAL HEADWAY, $t_{c,x}$

Base Crit HW	t_{cbase}	6.90	-	-	-	-	4.10	6.40	6.90	-	-	-	-	4.10	6.40
Adj for HV	$t_{c,HV}$	2.00	2.00	2.00	-	-	2.00	2.00	2.00	2.00	2.00	-	-	2.00	2.00
Prop. Of HV	P_{HV}	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Adj for Grade	$t_{c,G}$	0.10	0.20	0.20	-	-	-	-	0.10	0.20	0.20	-	-	-	-
Grades	G	1.00	1.00	1.00	-4.00	-4.00	-4.00	-4.00	1.00	1.00	1.00	4.00	4.00	4.00	4.00
Adj. for Int. Geom	$t_{3,LT}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Headway		7.00	-	-	-	-	4.10	6.40	7.00	-	-	-	-	4.10	6.40

FOLLOW UP HEADWAY, $t_{f,x}$																
Base Follow up HW	t_{fbase}	3.30	4.00	3.50	-	-	2.20	2.50	3.30	4.00	3.50	-	-	2.20	2.50
Adj for HV	$t_{f,HV}$	1.00	1.00	1.00	-	-	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00
Prop. Of HV	P_{HV}	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Follow up Headway	$t_{f,x}$	3.30	4.00	3.50	-	-	2.20	2.50	3.30	4.00	3.50	-	-	2.20	2.50

POTENTIAL CAPACITY, $c_{p,x}$															
Potential Cap - 1 Maneuver		916	536	617	-	-	1,337	1,019	912	538	615	-	-	1,344	1,028

COMPUTE MOVEMENT CAPACITIES, $C_{m,j}$																
MOVEMENTS			**12**	**11**	**10**	**-**	**-**	**4**	**4U**	**9**	**8**	**7**	**-**	**-**	**1**	**1U**
Compute Rank 1 Mov Cap's																
Compute Rank 2 Mov Cap's		Step 7a						1,337							1,344	
		Step 7b	916							912						
		Step 7c							1,007							1,028
Compute f_{1U}	1.00000															
Comput f_{4U}	0.98793															
		Step 7d														
Use Eqn 20-42 as the LT and T lanes are not shared.																
Compute $p_{0,j}$	j = 1 or 4															
$p_{0,1}$	1.00000		$p_{0,1U}$	1.00000												
$p_{0,4}$	0.99402		$p_{0,4U}$	1.00000												
Compute Rank 3 Mov Cap's		Step 8a														
Rank 3 One Stage Movement																
f_k	0.99402		(capacity adjustment factor)													
Compute $c_{m,k}$																
Movement Cap - 2 Maneuver				533							535					
	STAGE 1			689							699					
	STAGE 2			696							689					
Rank 3 Two Stage Movement																
Compute adj factors a and y		Step 8b														
nm	2.00															
a	0.94910															
C_{II}	Red															
v_L (1 and 1U)	0															
v_L (4 and 4U)	8															
Select max v_L	8															
y				1.00455							1.12506					
Compute Total Cap, C_T (Cap 2 Maneuver)				604							605					

Compute Rank 4 Mov Cap's		Step 9a		
$p_{0,8}$	1.00000			
$p_{0,11}$	1.00000			
For Rank 4, Mvmt 7, p'' =		0.99402		
From eqn 20-52, p' =		0.99544		
For Rank 4, Mvmt 10, p'' =		0.99402		
From eqn 20-52, p' =		0.99544		
$p_{0,9}$	0.98793			
$p_{0,12}$	1.00000			
$f_{p,l}$			0.99544	0.98343
Compute $c_{m,l}$				
Movement Cap - 2 Maneuver			614	604
nm	2.00			
a	0.94910			
C_{ll}	Red			
v_L (1 and 1U)	0			
v_L (4 and 4U)	8			
Select max v_L	8			
γ			0.43621	0.54243
Compute Total Cap, C_T (Cap 2 Maneuver)			674	673

COMPUTE MOVEMENT CONTROL DELAY

Step 11a

Compute CD for Rank 2 - Rank 4 Movements

MOVEMENTS			**12**	**11**	**10**	-	-	**4**	**4U**	**9**	**8**	**7**	-	-	**1**	**1U**
$C_{m,x}$	(veh/hr)	T	916	604	674			1,337	1,007	912	605	673			1,344	1,028
d = Control delay (sec/veh)	h	0.25	8.9	11.0	10.3			7.7	8.6	9.0	10.9	10.4			7.7	8.5
v/c Ratio			0.00	0.00	0.00			0.01	0.00	0.01	0.00	0.02			0.00	0.00
HCM LOS			A	B	B			A	A	A	B	B			A	A

COMPUTE APPROACH CONTROL DELAY

d_A (southbound)	#DIV/0!	s/veh	d_A (northbound)	9.69	s/veh
HCM LOS	#DIV/0!		HCM LOS	A	

COMPUTE 95TH PERCENTILE QUEUE LENGTHS

	T												
	0.25												
Q_{95}		0.00000	0.00000	0.00000			0.01805	0.00000	0.03663	0.00000	0.05446		0.00000	0.00000

CAPACITY CALCULATIONS

Intersection Info: **Tracker Road and Maxine Ave. - 2043 Build Scenario - AM Peak Hour**

CONVERT MOVEMENT DEMAND VOLUMES TO FLOW RATES

MOVEMENT			SBR	SBT	SBL	WBR	WBT	WBL	WBU	NBR	NBT	NBL	EBR	EBT	EBL	EBU
TRAFFIC VOLUME		veh/hr	0	0	0	0	297	16	0	3	0	8	8	144	0	0
GRADES	G	integer %	1	1	1	-4	-4	-4	-4	1	1	1	4	4	4	4
PHF			92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%
% HEAVY		integer %	0	0	0	0	8	0	0	0	0	0	0	0	0	0
MVMT FLOW	v_i	veh/hr	0	0	0	0	323	17	0	3	0	9	9	157	0	0

CONFLICTING FLOW RATES, $V_{c,x}$

MOVEMENTS	**12**	**11**	**10**	**-**	**-**	**4**	**4U**	**9**	**8**	**7**	**-**	**-**	**1**	**1U**
CONFLICTING FLOW ALL	162	523	436	-	-	166	166	83	519	357	-	-	323	323

CRITICAL HEADWAY, $t_{c,x}$

Base Crit HW	t_{cbase}	6.90	-	-	-	-	4.10	6.40	6.90	-	-	-	-	4.10	6.40
Adj for HV	$t_{c,HV}$	2.00	2.00	2.00	-	-	2.00	2.00	2.00	2.00	2.00	-	-	2.00	2.00
Prop. Of HV	P_{HV}	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Adj for Grade	$t_{c,G}$	0.10	0.20	0.20	-	-	-	-	0.10	0.20	0.20	-	-	-	-
Grades	G	1.00	1.00	1.00	-4.00	-4.00	-4.00	-4.00	1.00	1.00	1.00	4.00	4.00	4.00	4.00
Adj. for Int. Geom	$t_{3,LT}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Headway		7.00	-	-	-	-	4.10	6.40	7.00	-	-	-	-	4.10	6.40

FOLLOW UP HEADWAY, $t_{f,x}$																
Base Follow up HW	t_{fbase}	3.30	4.00	3.50	-	-	2.20	2.50	3.30	4.00	3.50	-	-	2.20	2.50
Adj for HV	$t_{f,HV}$	1.00	1.00	1.00	-	-	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00
Prop. Of HV	P_{HV}	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Follow up Headway	$t_{f,x}$	3.30	4.00	3.50	-	-	2.20	2.50	3.30	4.00	3.50	-	-	2.20	2.50

POTENTIAL CAPACITY, $c_{p,x}$															
Potential Cap - 1 Maneuver	857	518	561	-	-	1,424	1,135	964	521	626	-	-	1,248	905

COMPUTE MOVEMENT CAPACITIES, $C_{m,j}$																
MOVEMENTS			**12**	**11**	**10**	**-**	**-**	**4**	**4U**	**9**	**8**	**7**	**-**	**-**	**1**	**1U**
Compute Rank 1 Mov Cap's																
Compute Rank 2 Mov Cap's		Step 7a						1,424							1,248	
		Step 7b	857							964						
		Step 7c							1,131							905
Compute f_{1U}	1.00000															
Comput f_{4U}	0.99689															
		Step 7d														
Use Eqn 20-42 as the LT and T lanes are not shared.																
Compute $p_{0,j}$	j = 1 or 4															
$p_{0,1}$	1.00000		$p_{0,1U}$	1.00000												
$p_{0,4}$	0.98806		$p_{0,4U}$	1.00000												
Compute Rank 3 Mov Cap's		Step 8a														
Rank 3 One Stage Movement																
f_k	0.98806		(capacity adjustment factor)													
Compute $c_{m,k}$																
Movement Cap - 2 Maneuver				512							515					
	STAGE 1			612							752					
	STAGE 2			749							612					
Rank 3 Two Stage Movement																
Compute adj factors a and y		Step 8b														
nm	2.00															
a	0.94910															
C_{II}	Red															
v_L (1 and 1U)	0															
v_L (4 and 4U)	17															
Select max v_L	17															
y				0.45503							2.95526					
Compute Total Cap, C_T (Cap 2 Maneuver)				569							559					

Compute Rank 4 Mov Cap's		Step 9a		
$p_{0,8}$	1.00000			
$p_{0,11}$	1.00000			
For Rank 4, Mvmt 7, p'' =		0.98806		
From eqn 20-52, p' =		0.99090		
For Rank 4, Mvmt 10, p'' =		0.98806		
From eqn 20-52, p' =		0.99090		
$p_{0,9}$	0.99689			
$p_{0,12}$	1.00000			
$f_{p,l}$			0.99090	0.98781
Compute $c_{m,l}$				
Movement Cap - 2 Maneuver			556	619
nm	2.00			
a	0.94910			
C_{ll}	Red			
v_L (1 and 1U)	0			
v_L (4 and 4U)	17			
Select max v_L	17			
γ			0.18976	1.39044
Compute Total Cap, C_T (Cap 2 Maneuver)			587	689

COMPUTE MOVEMENT CONTROL DELAY

Step 11a

Compute CD for Rank 2 - Rank 4 Movements

MOVEMENTS			**12**	**11**	**10**	**-**	**-**	**4**	**4U**	**9**	**8**	**7**	**-**	**-**	**1**	**1U**
$C_{m,x}$	(veh/hr)	T	857	569	587			1,424	1,131	964	559	689			1,248	905
d = Control delay (sec/veh)	h	0.25	9.2	11.3	11.1			7.5	8.2	8.7	11.4	10.2			7.9	9.0
v/c Ratio			0.00	0.00	0.00			0.01	0.00	0.00	0.00	0.01			0.00	0.00
HCM LOS			A	B	B			A	A	A	B	B			A	A

COMPUTE APPROACH CONTROL DELAY

d_A (southbound)	#DIV/0!	s/veh	d_A (northbound)	9.85	s/veh
HCM LOS	#DIV/0!		HCM LOS	A	

COMPUTE 95TH PERCENTILE QUEUE LENGTHS

	T											
	0.25											
Q_{95}		0.00000	0.00000	0.00000	0.03623	0.00000	0.00936	0.00000	0.03968	0.00000	0.00000

CAPACITY CALCULATIONS

Intersection Info: **Tracker Road and Maxine Ave. - 2043 Build Scenario - PM Peak Hour**

CONVERT MOVEMENT DEMAND VOLUMES TO FLOW RATES

MOVEMENT			SBR	SBT	SBL	WBR	WBT	WBL	WBU	NBR	NBT	NBL	EBR	EBT	EBL	EBU
TRAFFIC VOLUME		veh/hr	0	0	0	0	321	7	0	10	0	11	7	319	0	0
GRADES	G	integer %	1	1	1	-4	-4	-4	-4	1	1	1	4	4	4	4
PHF			92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%
% HEAVY		integer %	0	0	0	0	0	0	0	0	0	0	0	1	0	0
MVMT FLOW	v_i	veh/hr	0	0	0	0	349	8	0	11	0	12	8	347	0	0

CONFLICTING FLOW RATES, $V_{c,x}$

MOVEMENTS	**12**	**11**	**10**	**-**	**-**	**4**	**4U**	**9**	**8**	**7**	**-**	**-**	**1**	**1U**
CONFLICTING FLOW ALL	175	720	539	-	-	355	355	178	716	542	-	-	349	349

CRITICAL HEADWAY, $t_{c,x}$

Base Crit HW	t_{cbase}	6.90	-	-	-	-	4.10	6.40	6.90	-	-	-	-	4.10	6.40
Adj for HV	$t_{c,HV}$	2.00	2.00	2.00	-	-	2.00	2.00	2.00	2.00	2.00	-	-	2.00	2.00
Prop. Of HV	P_{HV}	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Adj for Grade	$t_{c,G}$	0.10	0.20	0.20	-	-	-	-	0.10	0.20	0.20	-	-	-	-
Grades	G	1.00	1.00	1.00	-4.00	-4.00	-4.00	-4.00	1.00	1.00	1.00	4.00	4.00	4.00	4.00
Adj. for Int. Geom	$t_{3,LT}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Headway		7.00	-	-	-	-	4.10	6.40	7.00	-	-	-	-	4.10	6.40

FOLLOW UP HEADWAY, $t_{f,x}$																
Base Follow up HW	t_{fbase}	3.30	4.00	3.50	-	-	2.20	2.50	3.30	4.00	3.50	-	-	2.20	2.50
Adj for HV	$t_{f,HV}$	1.00	1.00	1.00	-	-	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00
Prop. Of HV	P_{HV}	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00
Follow up Headway	$t_{f,x}$	3.30	4.00	3.50	-	-	2.20	2.50	3.30	4.00	3.50	-	-	2.20	2.50

POTENTIAL CAPACITY, $c_{p,x}$															
Potential Cap - 1 Maneuver	841	418	485	-	-	1,215	864	837	420	483	-	-	1,221	872

COMPUTE MOVEMENT CAPACITIES, $C_{m,j}$																
MOVEMENTS			**12**	**11**	**10**	**-**	**-**	**4**	**4U**	**9**	**8**	**7**	**-**	**-**	**1**	**1U**
Compute Rank 1 Mov Cap's																
Compute Rank 2 Mov Cap's		Step 7a						1,215							1,221	
		Step 7b	841							837						
		Step 7c							853							872
Compute f_{1U}	1.00000															
Comput f_{4U}	0.98686															
		Step 7d														
Use Eqn 20-42 as the LT and T lanes are not shared.																
Compute $p_{0,j}$	j = 1 or 4															
$p_{0,1}$	1.00000		$p_{0,1U}$	1.00000												
$p_{0,4}$	0.99342		$p_{0,4U}$	1.00000												
Compute Rank 3 Mov Cap's		Step 8a														
Rank 3 One Stage Movement																
f_k	0.99342		(capacity adjustment factor)													
Compute $c_{m,k}$																
Movement Cap - 2 Maneuver				415							417					
	STAGE 1			610							619					
	STAGE 2			617							610					
Rank 3 Two Stage Movement																
Compute adj factors a and y		Step 8b														
nm	2.00															
a	0.94910															
C_{II}	Red															
v_L (1 and 1U)	0															
v_L (4 and 4U)	8															
Select max v_L	8															
y				1.00759							1.09278					
Compute Total Cap, C_T (Cap 2 Maneuver)				517							518					

Compute Rank 4 Mov Cap's		Step 9a		
$p_{0,8}$	1.00000			
$p_{0,11}$	1.00000			
For Rank 4, Mvmt 7, p'' =		0.99342		
From eqn 20-52, p' =		0.99498		
For Rank 4, Mvmt 10, p'' =		0.99342		
From eqn 20-52, p' =		0.99498		
$p_{0,9}$	0.98686			
$p_{0,12}$	1.00000			
$f_{p,l}$			0.99498	0.98190
Compute $c_{m,l}$				
Movement Cap - 2 Maneuver			483	474
nm	2.00			
a	0.94910			
C_{ll}	Red			
v_L (1 and 1U)	0			
v_L (4 and 4U)	8			
Select max v_L	8			
γ			0.42512	0.49710
Compute Total Cap, C_T (Cap 2 Maneuver)			571	569

COMPUTE MOVEMENT CONTROL DELAY

Step 11a

Compute CD for Rank 2 - Rank 4 Movements

MOVEMENTS			**12**	**11**	**10**	-	-	**4**	**4U**	**9**	**8**	**7**	-	-	**1**	**1U**
$C_{m,x}$	(veh/hr)	T	841	517	571			1,215	853	837	518	569			1,221	872
d = Control delay (sec/veh)	h	0.25	9.3	12.0	11.3			8.0	9.2	9.3	11.9	11.3			7.9	9.1
v/c Ratio			0.00	0.00	0.00			0.01	0.00	0.01	0.00	0.02			0.00	0.00
HCM LOS			A	B	B			A	A	A	B	B			A	A

COMPUTE APPROACH CONTROL DELAY

d_A (southbound)	#DIV/0!	s/veh	d_A (northbound)	10.36	s/veh
HCM LOS	#DIV/0!		HCM LOS	B	

COMPUTE 95TH PERCENTILE QUEUE LENGTHS

	T												
	0.25												
Q_{95}		0.00000	0.00000	0.00000		0.01988	0.00000	0.03993	0.00000	0.06456		0.00000	0.00000

TOTH
& ASSOCIATES

TOTH & ASSOCIATES
1550 East Republic Road
Springfield, MO 65804
tothassociates.com
417.888.0645

COUNCIL BILL EXHIBIT A - ATTACHMENT 3

July 16, 2021

Mr. Garrett Tyson
Director of Planning & Development
City of Nixa, MO

RE: Walker Property – Traffic Impact Study – Peer Review

Dear Mr. Tyson,

Please accept this letter as our response to select review comments provided in a memo from Mr. Jason Sommerer dated July 13, 2021. Select review comments have been shown in italics for your convenience.

1. *The TIS presents findings related to Stopping Sight Distance (SSD). For proposed public road intersections, such as Mandy Lane and Donald Street, Intersection Sight Distance (ISD) – Green Book Section 9.5 – should also be evaluated in addition to SSD. (Section 8 – Sight Distance Review - General Comment)*

   Refer to the attached ISD/SSD Summary (Exhibit 8), as well as an exhibit created to show Donald Street's provided ISD/SSD (Exhibit 7). The remaining 4 intersection analyses used the same approach as Donald Street. Utilizing the topo survey data, in addition to the recommendations provided in the memo, a more thorough and consistent approach was taken. This results in slightly different values than shown in the original TIS, but overall depicts a complete summary.

2. *Two of the proposed intersections were discussed in the report (Main Street at Mandy Lane; Tracker Road at Donald Street). The other two proposed intersections should also be discussed. (Main Street at Greenbriar Drive; Tracker Road at Maxine Avenue). (Section 8 – Sight Distance Review - General Comment)*

   Refer to the attached Exhibit 8, which depicts a summary of all SSD and ISD values.

3. *Roadway grade assumptions are noted for each intersection. Were these assumed from visual inspection or measured in some manner. (Section 8.1 – Minimum Sight Distance Review - General Comment)*

   Initially they were assumed from visual inspection, but upon responding to the comments in the memo, they were measured in a consistent manner based on the survey. Refer to Answer in Comment #1 above.

4. *For each driveway, "downgrade" or "upgrade" was not listed. (Section 8.1 – Minimum Sight Distance Review - General Comment)*

Refer to the attached Exhibit 8, which depicts upgrade (UG) or downgrade (DG), as applicable.

5. *What "height-of-object" and "height-of-eye" was utilized for the sight distance measurements? (Section 8.2 – Stopping Sight Distance Provided - General Comment)*

   Per the Green Book Section 3.2.6, for both the SSD and ISD, the "height-of-eye" distance utilized for measurements was 3.5 feet. For the SSD, the "height-of-object" distance utilized for measurements was 2.0 feet. For the ISD, the "height-of-object" distance utilized for measurements was 3.5 feet. Refer to the attached Exhibit 7 for an example of how the measurements were made based on survey data.

6. *Who will determine if it (tree trimming) is necessary? Who will be responsible for the trimming? (Section 8.3 – Additional Recommendations - General Comment)*

   These comments will be taken into consideration during the design of the subdivision road plans, but currently the intent would be for the HOA to take responsibility of ensuring safe sight lines at all intersections. The HOA will comply with all applicable City codes and statues in terms of sight line safety and recommendations.

7. *Is the assumption that culverts will be installed as part of the property development construction and that the roadway widening will tie into existing ditches? (OPCC - General Comments)*

   Yes. Culvert costs are not depicted in the attached cost estimate as they will be reflected in the subdivision design documentation.

   As a general response to the multiple price recommendations: Noted. Values in the cost estimate were modified per the recommendations in the memo. The revised Opinion of Probable Construction Costs has been attached for reference.

8. *Does the City want to tie directly into the intersection, to avoid the short taper in and back out? (OPCC - General Comments)*

   Based on discussions with the City, the desired approach is to not show any improvements being made to Main Street, as there is a plan in place for the City to make improvements to Main Street in the near future. Part of those improvements include lowering the hill just north of the Walker Woods Subdivision. As opposed to making improvements on Main, the City would prefer that Tracker Road be further improved by widening and milling/overlaying back to the west to where the existing curb and gutter terminates. Refer to the attached revised Exhibit 5 and revised Opinion of Probable Construction Costs that depict these changes.

If you have any additional comments or questions, please don't hesitate to call me at 417-888-0645.

Respectfully,

David Garrett, PE, CFM

Project Manager

KEY NOTES:

1. INSTALL TURN LANE IMPROVEMENTS.
2. PROPOSED INTERSECTION.

SCALE: 1" = 200'

N

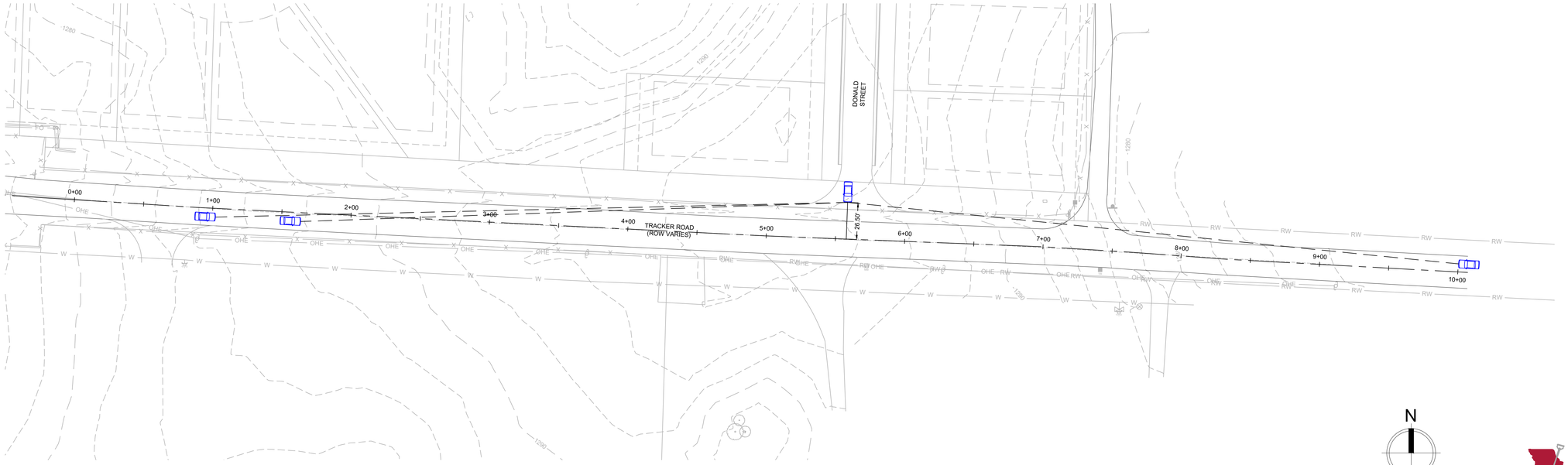
Copyright © 2021 by
Toth & Associates, Inc.

TRACKER AND MAIN
NIXA, MISSOURI

EXHIBIT 5

JOB NUMBER:	72.010
ISSUED DATE:	06/18/2021

TOTH & ASSOCIATES
1550 E. Republic Road, Springfield MO. 65804
Toth & Associates, Inc.
Missouri State Certificate of Authority #2004004242



N

0 20 40

4
2
0

NOTE: DRAWING REPRODUCTION AND SCALING MAY CHANGE THE INDICATED GRAPHIC SCALES

H. SCALE: 1" = 40'

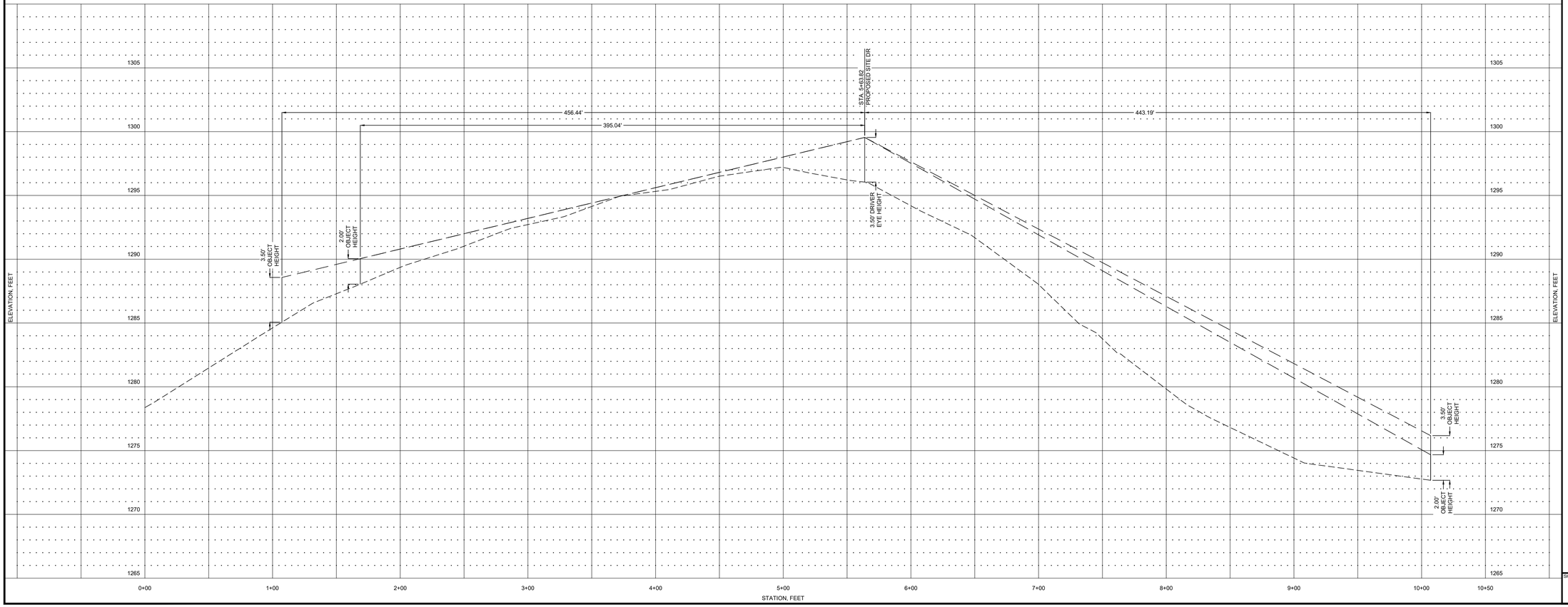
V. SCALE: 1" = 4'

MISSOURI ONE CALL SYSTEM

Call or Click Before You Dig!

1-800-DIG-RITE or 811

mo1call.com



#	REVISION	DATE

PRELIMINARY
FOR REVIEW AND
DISCUSSION ONLY

DWN. BY:
CKD. BY:
APPD. BY:
DATE: 07/15/2021
SCALE: AS SHOWN

Graphic scale may change due to drawing reproduction

TOTH & ASSOCIATES
830 E PRIMROSE, SUITE 200
SPRINGFIELD, MO 65807
Ph: 417-888-0045 Fax: 417-888-0657
www.tothassociates.com
CERTIFICATE OF AUTHORITY:
LC-2007000203 LS-2007000203

© 2020 Toth and Associates, Inc.
Drawings and specifications are not intended for use on other projects at this site or other sites without written approval of the engineer

WALKER WOODS SUBDIVISION - IMPROVEMENT PLANS

CITY OF NIXA, CHRISTIAN COUNTY, STATE OF MISSOURI

163 EAST TRACKER ROAD, NIXA MISSOURI 65714

EXHIBIT 7 - SSD AND ISD MEASUREMENTS

SHT NO: 001

EXHIBIT 8 - ISD/SSD SUMMARY

STREET NAME	DIRECTION	APPROX. GRADE	ADJ. NEEDED?	UG/DG/NA	SSD REQ. (FT)	SSD PROV. (FT)	SSD MET?	ISD REQ. (FT)	ISD PROV. (FT)	ISD MET?
DONALD	EAST	6.00%	YES	UG	184	>440	YES	384	>440	YES
DONALD	WEST	3.00%	NO	UG	200	395	YES	335	456	YES
MANDY	NORTH	1.96%	NO	NA	305	345	YES	445	345	NO [2]
MANDY	SOUTH	2.43%	NO	NA	305	>500	YES	445	>500	YES
GREENBRIAR	NORTH	1.54%	NO	NA	250	>400	YES	390	>400	YES
GREENBRIAR	SOUTH	0.60%	NO	NA	250	>400	YES	390	>400	YES
MAXINE	EAST	3.00%	NO	UG	205	440	YES	335	440	YES
MAXINE	WEST	3.00%	NO	DG	200	>500	YES	335	>500	YES

NOTES:

1. SPEED LIMITS: TRACKER EAST OF MAIN 30 MPH. MAIN NORTH OF TRACKER 40 MPH. MAIN SOUTH OF TRACKER 35 MPH
2. MANDY NORTH ISD NOT MET BASED ON EXISTING CONDITIONS BUT LIKELY WILL BE MET UPON MAIN STREET IMPROVEMENTS BY CITY DUE TO THE PROPOSED LOWERING OF THE EXISTING TERRAIN FOR THE CONSTRUCTION OF NEW ROADWAY.

Preliminary Opinion of Probable Construction Costs
Tracker and Main, Nixa, Missouri

TRACKER AND MAIN ROADWAY IMPROVEMENTS

Item	Description	Quantity	Units	Unit Price	Total Cost
1.00	**EARTHWORK**				
1.01	Clearing and Grubbing	1	LS	$5,000	$5,000
1.02	Sawcut and Removal of Existing Pavement	1	LS	$5,000	$5,000
1.03	Coldmilling Existing Pavement	200	SY	$10	$2,000
1.04	Site Grading - Cut (Unclassified)	700	CY	$10	$7,000
1.05	Site Grading - Fill	2,000	CY	$20	$40,000
1.06	Sediment and Erosion Control	1.0	LS	$7,000	$7,000
1.07	Seed, Fertilizer, and Mulch	1.0	AC	$4,500	$4,500
				SUBTOTAL	**$70,500**

Item	Description	Quantity	Units	Unit Price	Total Cost
2.00	**PAVING AND MISC.**				
2.01	6 in. Heavy Duty Asphalt Pavement	11,450	SF	$3.50	$40,075
2.02	8 in. Aggregate Base for Heavy Duty Asphalt	11,450	SF	$1.10	$12,595
2.03	Asphalt Pavement for Overlay (1.75" Thick)	29,100	SF	$1.25	$36,375
2.04	Pavement Markings	1	LS	$5,000	$5,000
2.05	Signage	1	LS	$3,500	$3,500
2.06	Traffic Control	1	LS	$10,000	$10,000
				SUBTOTAL	**$107,545**

Item	Description	Quantity	Units	Unit Price	Total Cost
3.00	**UTILITIES**				
3.01	Relocation of Existing Utilites	1	LS	$15,000	$15,000
					$15,000

CONSTRUCTION TOTALS

Construction Total	$193,045
Construction Contingency (20%)	$38,700
Mobilization, Demobilization, and Bonding (5%)	$11,587
Professional Services (23%)	$56,000
TOTAL	**$299,332**

NOTICE:
Opinion of Probable Construction Cost: The services, if any, of Engineer with respect to Opinion of Probable Construction Cost are to be made on the basis of Engineer's experience and qualifications and represent Engineer's best judgement as an experienced and qualified professional generally familiar with the construction industry. However, since Engineer has no control over the cost of labor, materials, equipment, or services furnished by others, or over contractor's methods of determining prices, or over competitive bidding or market conditions, Engineer cannot and does not guarantee that proposals, bids, or actual Construction Cost will not vary from Opinions of Probable Construction Cost prepared by Engineer.